THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
June 13, 1988 · Vol. XXII · No. 24 · 156 Pages · $2/Copy · $44/Year

COMPUTERWORLD

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Study refires VDT safety debate

Shows link between heavy use and miscarriages; does not pinpoint cause

BY J. A. SAVAGE
CW STAFF

OAKLAND, Calif. — Combatants on both sides of a long-smoldering VDT safety debate reacted strongly to a study released last week indicating a radically higher risk of miscarriage for women who work at computer terminals 20 hours per week or more than for non-VDT users.

Specifically, the study by The Kaiser Permanente Medical Group, Inc. showed that the ratio of miscarriages to live births was 80% higher for heavy users of VDTs than for nonusers.

The authors of the study, however, were quick to say that they cannot determine whether the abnormally high miscarriage rate was caused by the VDTs themselves or by other work-related factors.

"It's too early to give advice," said Robert Hiatt, a senior epidemiologist at Kaiser Permanente. "I don't think women should be alarmed, but it justifies further studies."

The four-year study of 1,600 women in California's Silicon Valley showed that women in support and administrative jobs had the highest correlation between VDT exposure and miscarriage — more than triple that of non-VDT users.

The study, the largest in the U.S. to date, also documented a greater risk of birth defects among heavy and moderate VDT users. But researchers said the study population was too

Continued on page 8

Pregnancies at risk?

A Kaiser Permanente study documented an increased miscarriage rate for women using VDTs for more than 20 hours per week

VDT use (hour/week)	Number of live births	Number of miscarriages	Miscarriage rate
None	510	240	32%
Less than five	77	29	27.3%
Five to 20	71	34	32.4%
More than 20	65	52	44.4%

INFORMATION PROVIDED BY THE KAISER PERMANENTE MEDICAL GROUP, INC.
CW CHART

1-2-3 repels spreadsheet challenges

BY STEPHEN JONES
CW STAFF

Despite criticisms of upgrade delays for 1-2-3 and stagnant technology, Lotus Development Corp. is staring down some strong competition in the latest spreadsheet war skirmish.

The challenges aimed at Lotus's spreadsheet dominance have thus far proven to be little more than an occasional potshot aimed at taking away some of 1-2-3's expansive installed base. Market research shows that Microsoft Corp.'s Excel and Borland International's Quattro, while successful in their own right, have not taken much of a bite out of sales of Lotus's bread-and-butter DOS program.

Early figures show only limited interest in the two challengers — interest that may have already peaked among many DOS users. Cupertino, Calif.-based Infocorp estimated that Microsoft will ship about 120,000 copies of Excel this year and that Borland will ship 150,000 copies of Quattro.

In sharp contrast, Lotus is expected to ship roughly 100,000 copies of 1-2-3 *each month* this year — a total of more than one million copies for the year and a market share of about 70%, according to Infocorp.

Such news is a boost for Lotus, which, for the first time in the history of 1-2-3, has had to fight to keep users from defect-

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See no evil: Municipal MIS works around S. Africa bans

BY J. A. SAVAGE
and JEAN S. BOZMAN
CW STAFF

In nearly every U.S. city that has enacted laws prohibiting purchases from companies that do business with South Africa, the ordinances contain loopholes big enough to drive a mainframe through. In a recent sampling of MIS directors in those cities, only one said the ban will affect purchasing plans; others said such bans pose only a slight inconvenience, if any at all, to business as usual.

The municipal restrictions have been ineffective at best. "I sometimes joke that if the government of South Africa came in with a low bid, we would take it," said Sharon Stenen, an MIS administrative assistant for the City of Los Angeles.

Los Angeles' procurement ban mandates consideration of a South Africa connection in projects that cost less than $25,000. "We're careful with smaller awards," said Stenen, adding that the city continues to make awards to IBM and bought a new 3090 Model 400 mainframe last year after the ban was in place.

The computer connection has been a primary target of anti-apartheid activity be-

Continued on page 144

Steep cuts for 9370 software

BY ROSEMARY HAMILTON
CW STAFF

IBM chopped prices last week on dozens of software programs for its 9370, a move observers said is a long-overdue attempt to draw users to the lackluster mid-range processors.

IBM cut prices an average of 25% on 150 software programs for its Group 10 processors, to which the 9370 Models 20 and 40 belong.

The firm also created a new processor category, Group 15, to which the 9370 Model 60 now belongs. Group 15 pricing comes in lower — in some cases as much as 42% lower — than the previous Model 60 category, Group 20.

The high-end 9370 Model 90 remains in the Group 20 category and is not affected by the price cuts.

Follow the leader?

Third-party software houses, many of which followed IBM's lead last year and instituted their own graduated pricing structures, said they are evaluating the latest cuts. At least two companies — Software AG of North America, Inc. and Cullinet Software, Inc. — said they do not intend to cut prices on Group 10 software licenses.

"This is just making way for new processors. We anticipate an announcement like that very shortly," said Lin Pearce, chief operating officer of Software AG. Pearce said his firm created a Group 15 processor category three months ago to offer more reasonable pricing for the 9370 Model 60.

"In my mind, the new [pricing] category is an attempt to straighten out their mid-range," commented Jeffrey Papows, vice-president of marketing at Cullinet. "We won't be reacting to these cuts, at least not at this time."

A spokesman at Applied Data Research, Inc., which offers two pricing categories for 9370s, said the company was reviewing IBM's revisions and had not decided if it would add another category in its pricing structure to

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NEWSPAPER
SECOND CLASS MAIL

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Novell nets Mac. Novell's Netware LAN software finally debuts for Macintosh; helps Apple put its foot in MS-DOS, OS/2 doors. Page 15.

IBM transforms CSP. With technology licensed from Transform Logic, IBM hopes to mold its Cross System Product into an end user-oriented fourth-generation language and attract business professionals to its user community. Page 145.

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"It is an accomplishment just to get MIS to agree to put VAXs and IBM in the same room."

LARRY DEBOEVER
DEBOEVER & ASSOCIATES, INC.

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Unisys, NCR flirting?

Rumors arise that offer was made and rebuffed

BY ALAN ALPER
CW STAFF

NEW YORK — For the third time in the last year, reports reverberated throughout Wall Street suggesting that Unisys Corp. had made recent overtures to acquire NCR Corp. Spokesmen for both firms declined to comment.

Industry analysts, however, said word of Unisys's interest in NCR percolated throughout both companies during the last few weeks. One source inside Unisys, who requested anonymity, said internal speculation is that NCR rebuffed a Unisys acquisition offer in hopes of receiving sweeter terms. "There could be something going on, but no one is talking," the source said.

Frank Dzubek, president of Communications Network Architects, Inc., a Washington, D.C., consultancy, said sources within NCR suggested that the Dayton, Ohio-based company rejected Unisys's entreaties, but talks are said to be continuing. "It appears that the topic is open for discussion," he said.

Complementary outfits

The two companies would make a good strategic fit, some analysts suggested. NCR would strengthen Unisys's thrust in the Unix marketplace by virtue of the large installed base of its Tower family. Its Comten subsidiary would add luster to Unisys's Networks unit, which currently consists primarily of recently acquired Timeplex, Inc. NCR also has a successful semiconductor operation and builds its own microcomputers, which would help Unisys lower its cost structure.

In addition, the two firms would create a powerful force in the banking systems business and would enable Unisys to diversify into retailing systems, an area in which NCR is considered a leader. Moreover, a merger of the two firms would create a $16 billion company, giving Unisys Chairman W. Michael Blumenthal a better chance of accomplishing his often-stated goal of building a $20 billion company by the early 1990s.

Not everyone agrees that an acquisition is in the offing, however. Michael Geran, an analyst at The Nikko Securities Co., said talk of Unisys's interest in NCR is "irrational." While acknowledging that Blumenthal needs a large acquisition to meet his objectives, timing is a key ingredient in any purchase decision.

NCR would be difficult to acquire at this time because its balance sheet commands a premium price, and Chairman Charles Exeley is believed to favor an independent course. Unisys has other priorities, Geran noted, such as ensuring the successful launch of new mid-range and high-end mainframe products.

If Unisys is indeed interested in acquiring NCR, it most likely would have to make a friendly offer because of the stiff anti-takeover measures adopted last year by the Dayton firm.

"A pooling-of-interest deal — a merger for stock — would probably not interest NCR since it is hard to demonstrate shareholder value of the combined stock," noted Louis Giglio, an analyst at Bear Stearns & Co.

Cullinet pays for overhaul

BY NELL MARGOLIS
CW STAFF

WESTWOOD, Mass. — Cullinet Software, Inc. is still predicting record revenue for its fourth quarter ended April 30; on the profit side, however, the forecast issued late last week was a preview of coming subtractions.

The anticipated operational loss is principally due to the higher than expected costs of the company's recent major corporate reorganization and product rollout, said Jeffrey P. Papows, executive vice-president of marketing.

Earlier estimates pegged the bill for the corporate overhaul, which included a massive restructuring of internal functions and the layoff of some 400 employees, at approximately $8 million. The final figure, Papows said, will be approximately $12 million to $15 million.

No cataclysmic event fueled the escalation in cost, according to Papows.

Rather, the increases were attributable to such factors as the unanticipated expenses of conducting business internationally and legal and other administrative expenses involved in the divestiture of two companies.

In addition, he said, higher commission expenses and the cost of increased travel and training associated with Cullinet's spring product launch — in particular, the April debut of the IDMS/SQL data base — as well as head count expenses, which resulted when budgeted attrition did not occur, factored into the final figure.

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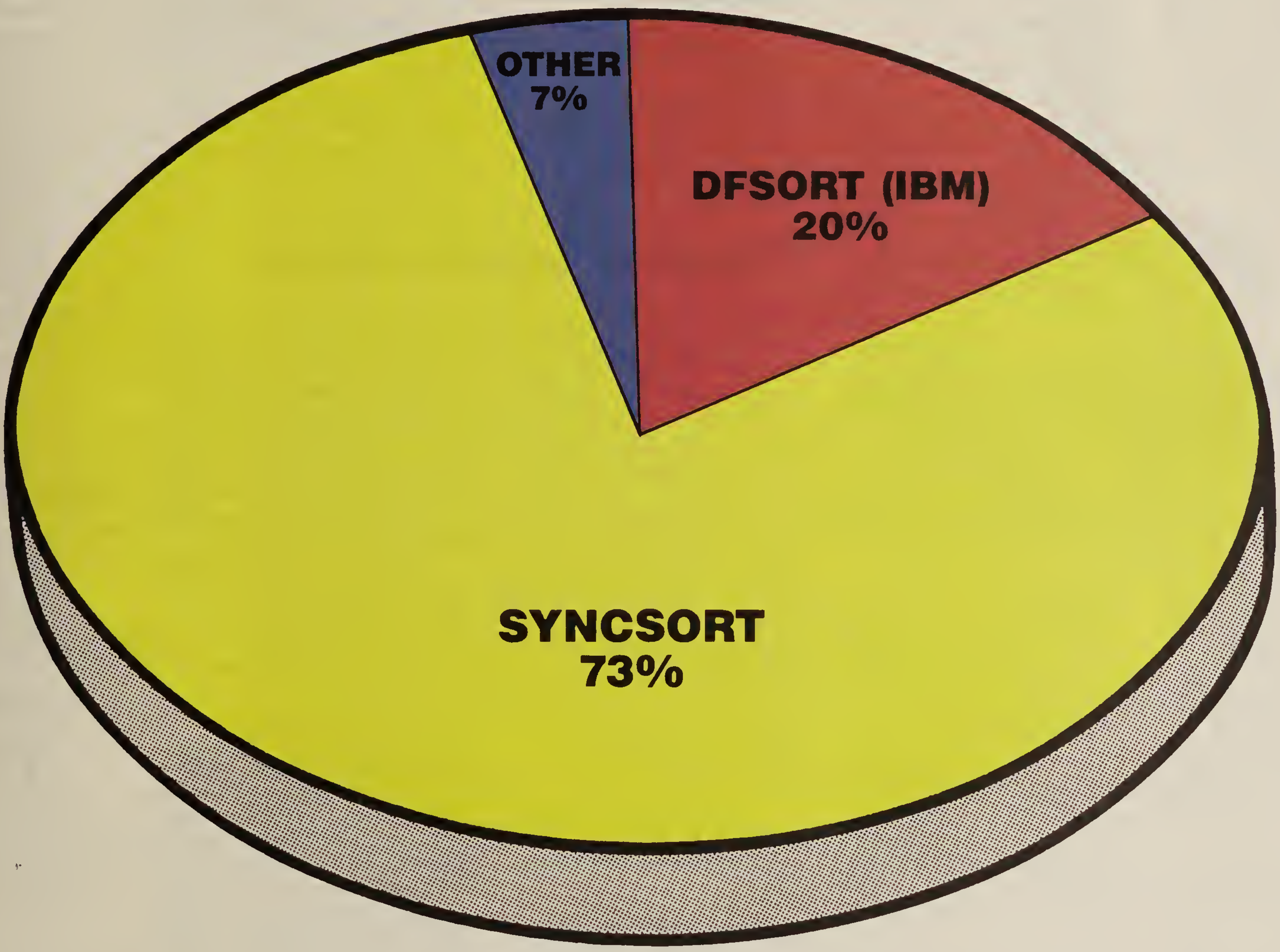
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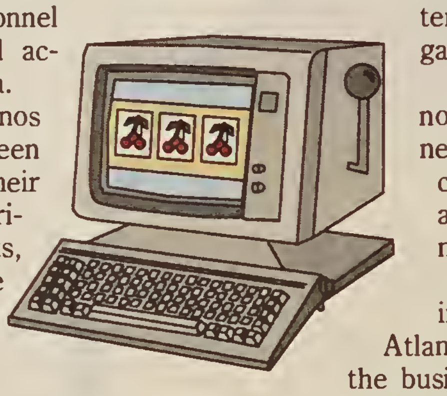
Casinos fight plan for computer access

BY MITCH BETTS
CW STAFF

ATLANTIC CITY — In a major dispute over government access to corporate computers, 11 Atlantic City casinos are fighting a proposal by the New Jersey Division of Gaming Enforcement (DGE) to obtain direct access to casino computers for investigations.

Unfettered computer access is necessary to fully investigate and regulate casino operations, DGE officials said. The prosecutorial agency, created in 1978 to keep the casinos free of organized crime, is especially interested in getting access to credit files and transaction data, complimentary services, player ratings, personnel systems and accounting data.



The casinos have been joined in their battle by privacy experts, who said the proposal would set a dangerous precedent by allowing government agents to go on secret "fishing expeditions" through business computers. Public comments on the proposal are due this week.

Eliminate duplication

The DGE, however, noted that it already has access to paper records, and the proposal for computer access would obviate the need for casinos to keep duplicate files in paper and electronic form.

The DGE is entitled to the computerized information but should create a due-process system allowing the casinos and employees to object to particular inquiries, said Peter Sheridan, vice-president of legal affairs for the Casino Association of New Jersey.

If the New Jersey casino regulation is approved, Sheridan said it would set a bad precedent for other heavily regulated or state-licensed industries.

The proposed regulation, published last month and pending before the state's Casino Control Commission, would require the licensed casinos to provide DGE investigators with inquiry-only access to all computer records.

Proposed rules

The requirement would have the following conditions:

- The New Jersey casinos must provide the DGE with an on-site terminal and the capability to make printouts.
- DGE personnel must be given "reasonable privacy in which to conduct such inquiries."
- Casinos may not track or monitor the DGE inquiries, and casino computers must be programmed to preclude any such tracking.
- Casinos may request a log of DGE inquiries that shows the general category of information examined and the time of the inquiry.
- Each casino must train DGE personnel in the use of its computer system.

The state DGE sought the same powers four years ago, but a protest by Harrah's Atlantic City, Inc. resulted in a 1985 court order that required the casino commission to hold an extensive hearing regarding the matter.

The DGE has now switched to a new regulatory proceeding to obtain access to the casino computers.

In an April 7 filing by 11 of the 12 Atlantic City casinos, the businesses raised numerous objections and argued that the new proceeding defies the 1985 court order.

Why the secrecy?

For example, the casinos objected to the secret, or "witnessless," search requirements in the proposal.

"The division has never been able to explain why its inquiries must be shielded from view, destroying the accountability of the agency," the casinos said.

In addition, the requirement that casinos turn off their tracking programs could jeopardize computer security, Sheridan said.

The resulting gaps in the computer audit trails will make it impossible to trace whether data was improperly obtained by a DGE agent or another party, he said.

Alan F. Westin, a privacy-law expert at Columbia University, and Advanced Information Management, Inc., a Woodbridge, Va.-based computer-security consulting firm, have been retained by the casinos to help fight the regulation.

Robert P. Campbell, president of Advanced Information, expressed concern that the proposal would allow state authorities to browse through the casino computers and view sensitive records on employees and hotel guests as well as casino profiles of "high rollers" describing their preferences in entertainment, liquor and food.

DEC raises memory prices

BY STANLEY GIBSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. last week raised prices on computer systems and add-on memory, effective immediately.

DEC boosted prices on systems with embedded memory by an average of 3.5% and hiked prices for add-on memory products by an average of 35%. A DEC spokesman said the price increases are because of the high costs of dynamic random-access memory chips.

Add-on memory for VAXBI bus systems will see stiffer increases than those for Q-bus systems. Costs for the 256K-bit chips used on Q-bus boards have risen at a lower rate than costs for 1M-bit chips used on VAXBI-bus boards, the spokesman said.

Low-end add-on memory products are expected to rise approximately 15% higher than the current prices, while memory products for high-end systems will rise approximately 50% higher.

Others to follow?

"I think you'll see a lot of companies following suit now," offered Steve Widen, a DEC analyst at International Data Corp. in Framingham, Mass.

EMC Corp. in Hopkinton, Mass., said it will boost memory prices for DEC systems on July 1 by as-yet undetermined amounts.

Microvax 2000 system prices will increase by 12%, the spokesman said, while other Microvax prices will go up by lesser amounts ranging down to 4% increases.

Mid-range VAX systems will increase in price by 3% to 5%. High-end systems will go up by 1% to 3%.

Trade bill back to Senate

WASHINGTON, D.C. — The U.S. Congress, with lobbying support from the computer industry, began work on a second omnibus trade bill last week after the Senate failed to override President Reagan's veto of the original bill.

The Computer and Business Equipment Manufacturers Association (CBEMA) urged Congress to pass the omnibus trade bill again, but without the plant-closing provision opposed by the president [CW, May 9].

"Our industry needs positive trade legislation this year," said William A. Maxwell, CBEMA's director of international issues, in a prepared statement. The industry supports provisions that liberalize export controls, seek access to foreign telecommunications markets and strengthen intellectual property rights.

The Senate voted 61-37, falling four votes short of the two-thirds majority required to override the president's veto.

MITCH BETTS

Round 1 goes to Duquesne

BY CLINTON WILDER
CW STAFF

FAIRFAX, Va. — A Virginia judge last week denied most of Computer Associates International, Inc.'s request to prevent two Duquesne Systems, Inc. employees from competing against Computer Associates in the systems software market.

Computer Associates won one small victory, however, as the two former Uccel Corp. employees were ordered not to sell Duquesne's Dasdmon storage management software to the federal government. But the company itself was not restricted from selling Dasdmon, which competes with Computer Associates' FastDASD.

Computer Associates filed a $5 million suit against Duquesne and sales employees James Holland and Kenneth Smartt earlier this year, claiming they had taken proprietary Uccel documents with them when they left Uccel's McLean, Va. office to work for Duquesne's office selling to federal government agencies from Vienna, Va. [CW, April 4]. The suit followed a search of Duquesne's office and seizure of the Uccel documents in March [CW, March 21].

Last week, Fairfax County Circuit Court Judge Johanna L. Fitzpatrick ordered Holland and Smartt to turn over to the court any Computer Associates or Uccel documents that they obtained while working for Uccel. The documents will be examined by attorneys for both sides in discovery proceedings before the Oct. 3 trial date.

Turning the documents over to the court will not prejudice the defendants' claims that they were not confidential, according to the judge's order.

"We are pleased that Duquesne prevailed on almost all of the issues at this stage," said Sandy Ferguson, an attorney for Pittsburgh-based Duquesne.

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Few takers for OS/2 Extended

BY DOUGLAS BARNEY
CW STAFF

IBM's proprietary data base management system and communications extensions to the OS/2 operating system, set to ship next month, have so far gathered scant user commitment.

Much of the user holdup is based on an increasing array of similar offerings, the inability to fully evaluate the unshipped IBM product, questions about OS/2's role in general and the expected absence of key features in the initial release of OS/2 Extended Edition.

The initial DBMS component is single-user, a market already ruled by Ashton-Tate Corp.'s Dbase, Microrim, Inc.'s R:Base and Borland International's Paradox. Meanwhile, most potential users are looking to implement a more sophisticated client/server version slated for mid-1989.

Another stumbling block is the continuing evaluation of OS/2, which still lacks the critical graphical user interface and suffers from a dearth of key applications. "We have not completed our analysis of the basic version. We don't know how to use the added features of [the] extended version, but we are looking at it in great depth," said Joe Selman, a spokesman for American Airlines. According to Selman, American has not yet decided how it will use the standard version of OS/2.

While declining to fully commit to the product, Extended Edition fans see a key potential role. "For a site like ours, it means standardization and ease of installation. We already use DB2 and SQL/DS. From what we have seen, it's a real nice fit," said Howard Fosdick, project leader for relational data bases at Amoco Corp.

"What could be nicer in a big IBM shop than PCs directly connected to the mainframe? With the Communications Manager and the Data Manager, we could communicate, download data bases from DB2 and put them on PCs in a nice, easy, seamless fashion," Fosdick said.

Despite Fosdick's positive view, it would take the agreement of all groups within Amoco to make Extended Edition a standard.

Like Fosdick, The Travelers Corp. is optimistic but remains a breath away from a full commitment. "I would expect that we will use it for sure," said Joe Correira, director of software development at Travelers. Correira breaks Extended Edition into four components: Communications Manager, Data Manager, LAN Server and Presentation Manager. "We have plans at each of those levels," he said.

By combining the DBMS and communications pieces, Travelers hopes to seamlessly share data between personal computers and host computers. Meanwhile, the Presentation Manager will offer users a more intuitive interface, and the LAN Server will boost the functionality of the firm's local-area networks.

Even though it is initially a single-user product, Correira said he sees the possiblity of using OS/2 Extended Edition as a front end to LAN-based products from companies such as Borland and Gupta Technologies, Inc.

Plans sketchy

While all users contacted by *Computerworld* were familiar with Extended Edition's features, those with definite plans are few and far between.

"You hear about it, you read about it, you get announcements from IBM, but I don't know of any plans to bring it in," said Ted Rock, manager of software support at Harris Bankcorp.

Some users remain confused, some are apathetic and some have an aversion to the product's requirements of 3M to 6M bytes of random-access memory and 30M bytes of hard disk.

IBM remains resolute

IBM says it is in the OS/2 Extended Edition game for the long haul and that the product will evolve in several ways over time:

- By mid-1989, it will be a full data base server under OS/2. And through an upgrade called Enhanced Communications Facility, it will act as a gateway to IBM's DB2 on the mainframe and the data on the System/36 and 38 family.
- By late 1989 or early 1990, the query manager will take full advantage of the OS/2 Presentation Manager interface.
- By 1990, Extended Edition and host data bases will communicate, allowing DB2 to extract data from Extended Edition. Transaction management will be handled by the data base queried, to ensure data integrity.
- After 1990, multisite joins and two-phase commits for data security will become available. Also planned is the ability to have individual data base tables fragmented and located on different machines.

DOUGLAS BARNEY

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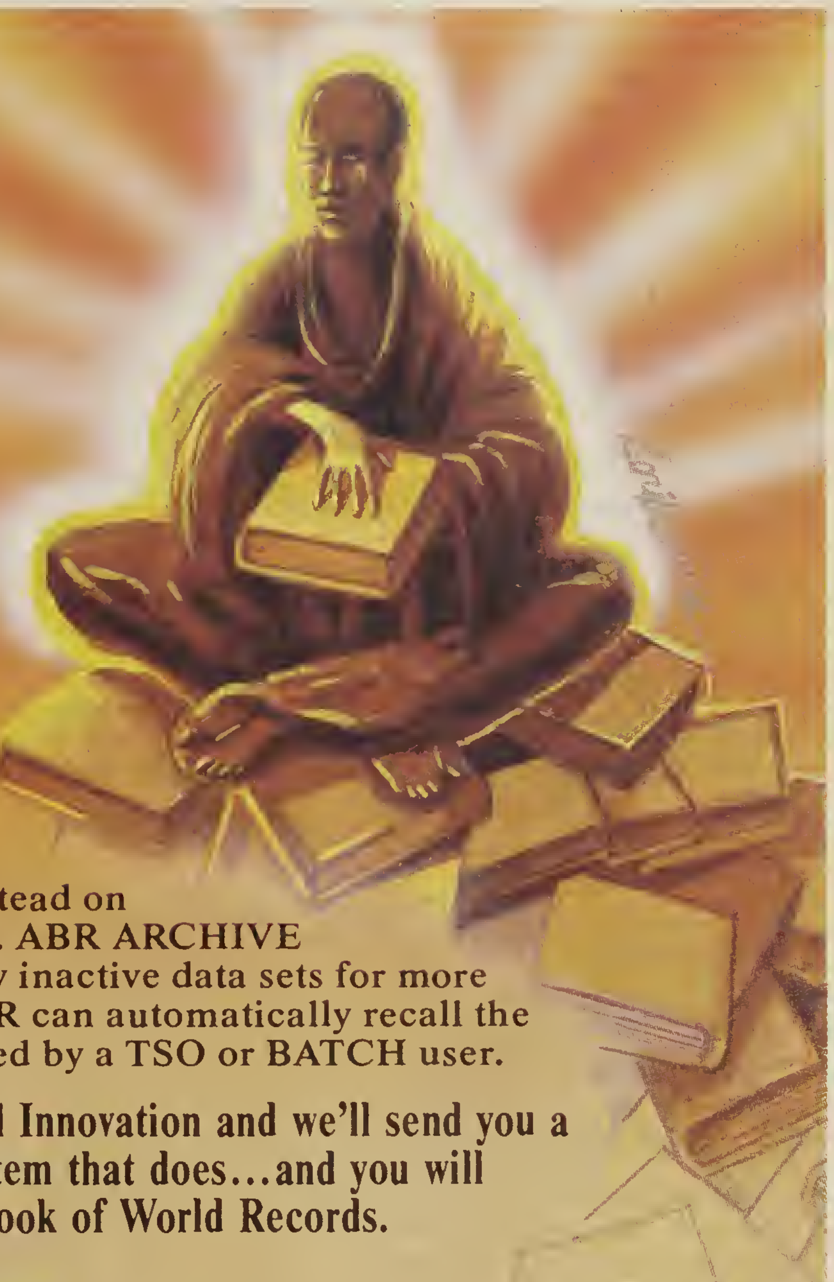
That's a lot of storage and recall . . . but it's a "drop in the bucket" compared to ABR Archive and Auto Recall.



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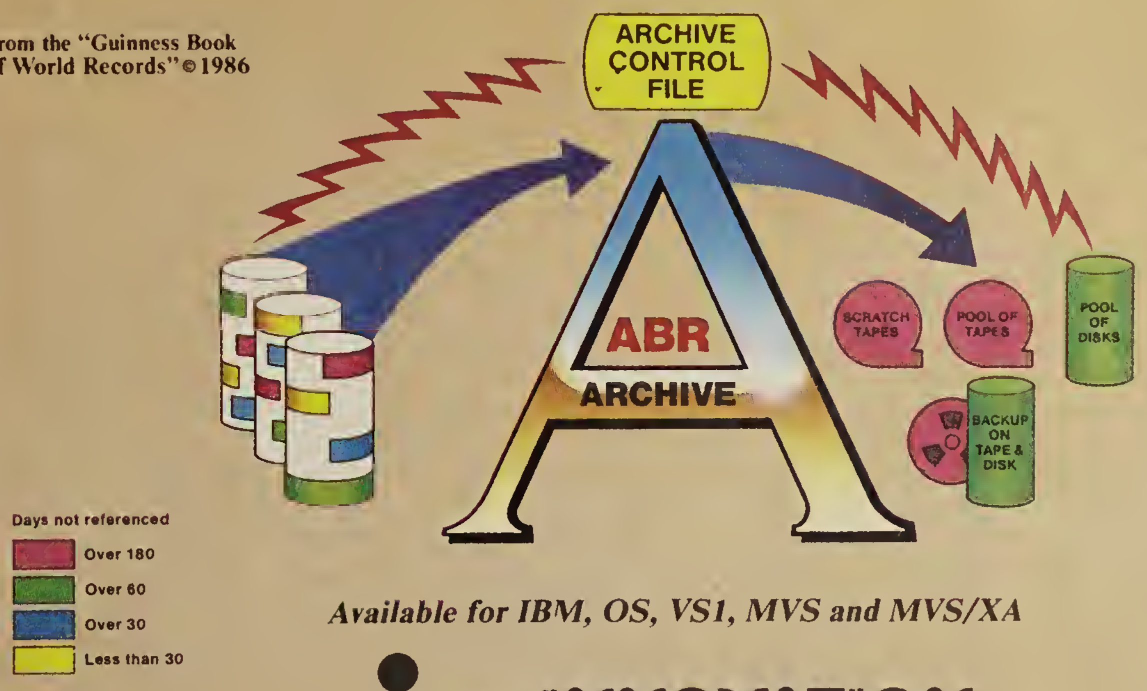

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MAP, OSI make the grade at ENE

Message to users is 'buy' — despite high cost — as vendors gauge interest

BY PATRICIA KEEFE
CW STAFF

BALTIMORE — Demonstrations of the Manufacturing Automation Protocol (MAP) and Open Systems Interconnect (OSI) standards were put to the test last week and passed with flying colors. But in a classic standoff, vendors remained unconvinced of customer interest in MAP products, and target customers said they will not buy until costs come down to a reasonable level.

A third, less visible irritant in the MAP ointment is its insistence on broadband, or IEEE 802.4, media. In this era of open systems and interoperability, media dependence just will not play on many a factory floor.

These issues will begin to abate by the end of the year, participants and attendees at last week's Enterprise Networking Event (ENE) predicted. And they will totally disappear within the next 12 to 18 months, added Bruce Richardson, an analyst at Advanced Manufacturing Research, Inc. (AMR) in Salem, Mass.

Specifically, MAP costs are expected to drop by one-third to one-half while the MAP/TOP Users Group moves quietly toward media independence for MAP.

ENE, held last week at the Baltimore Convention Center, achieved its primary goal — to demonstrate that products based on MAP, Technical and Office Protocol (TOP) and other OSI-standard specifications, for example, Message Handling System and ANSI's X.400, do exist and work today, attendees said.

The combined conference and exposition drew just less than 10,000 users, mostly at the management level, according to the MAP/TOP Users Group. "This much interest indicates that MAP/TOP is real," said a user from an aerospace company who declined to be named.

But interest alone will not translate into sales, Richardson warned.

Ultimatum

So the underlying message to users, who thus far have bought MAP- and TOP-based products in limited numbers, was loud and clear: It is time to put up or shut up.

Users need to start buying products in order to provide tangible proof that continued investment in OSI and MAP/TOP development is warranted and to let vendors begin to recoup substantial investments in MAP and other OSI standards, said Marc Warshaw, a product line manager at Xerox Corp.

Warshaw estimated that he has spent a year and a half working on the ENE project.

"I've spent a lot of [Xerox's] money [on MAP], and it's time to start giving something back," Warshaw said.

"A lot of vendors feel that way," agreed Robert Metcalfe, the newly appointed chairman of the Corporation for Open Systems.

Vendors have already been burned once. The announcement of MAP 3.0, which is incompatible with MAP 2.1, at the November 1985 Autofact show scuttled many MAP 2.1 sales, virtually killing the market in 1986.

GM's Kaminiski

Particularly hard hit were vendors committed to MAP 2.1, such as Industrial Networking, Inc. — formerly a joint venture between Ungermann-Bass, Inc. and General Electric Co. — and Concord Communications, Inc., AMR's Richardson said. Both firms have since moved to reposition themselves as OSI providers.

"It's a very fair thing for vendors to ask," said Daniel Kosmalski, manager of computer-integrated manufacturing at Merit Systems, Inc. in Troy, Mich., a software developer and users group member.

Nonetheless, vendors may have to bite the bullet and slash prices in order to stimulate sales, Richardson said. "They'll have to hope to make up the difference in volume," he added. Otherwise, cost will continue to be a major impediment to MAP installations.

"Although many users have indicated they are willing to pay a premium for MAP, many [find] present prices to be exorbitant," said a recent report from Venture Development Corp., a Natick, Mass.-based market researcher.

MAP proponents and users, including General Motors Corp., The Boeing Co., Deere & Co. and Aluminum Company of America, or Alcoa, were closely quizzed on costs at a two-hour press conference Monday. GM's Michael Kaminiski, who could be considered the godfather of MAP, ticked off the following predictions for skeptics:

- Broadband links, now centered at about $2,500, will drop to about $1,200 during the next year.
- Carrierband costs per node will drop from as much as $1,500 to $500 or $600 during the same period.

And despite the high cost of MAP, several users were able to demonstrate considerable savings following MAP installations. GM, for example, said it was able to cut a proprietary network cost per node from $3,580 to $2,930 using MAP, and Deere said it has reduced new-product development cycles by as much as 50%.

Also troublesome is MAP's insistence on broadband media. AMR surveys have consistently logged resistance to media dependence, citing the varied extremes of factory needs. Some users are even holding out for MAP over fiber.

GM throws over MAP leadership

After spending millions of dollars promoting factory automation and suffering accusations of dictatorial behavior in return, General Motors Corp. has called it quits as the leading proponent of the Manufacturing Automation Protocol (MAP).

"We are not dictators," said Michael Kaminiski, General Motors' Advanced Engineering staff manager. "We had tremendous resources applied [to MAP] to push it because we were in a hurry. [Otherwise], it could have taken another five to six years."

GM and others stressed that while the company is distancing itself as a MAP spokesman, its commitment as a user remains unwavering. "What they want to say is, 'Hey, we've done our part, the standard is stable, now we want to see some products," said Bruce Richardson, an analyst at Salem, Mass.-based Advanced Manufacturing Research, Inc.

As MAP becomes less identifiable as a GM technology, it is expected that competitors such as Ford Motor Co. and Chrysler Motors Corp. will move more aggressively toward MAP. Ford, for example, is said to be planning a MAP 2.1 implementation for the first quarter of 1989. In addition to a number of executives, the auto maker reportedly flew an astounding number of technical staff members — 32 in all — to last week's Enterprise Networking Event.

With its most notable member shying away from the limelight, the MAP/TOP Users Group has taken steps to become fully independent by Jan. 1, 1989, detailing plans last week for incorporation, a dedicated staff, annual dues and other revenue generation from the sale of educational products and increased membership. The revamped organization will change its name to the North American MAP/TOP Users Group, composed of both the U.S. and Canadian organizations.

In addition, the National Center for Manufacturing Science (NCMS) said it will assume responsibility for future MAP research, development and testing. Much of this activity and cost had previously been borne by GM, Eastman Kodak Co., the Society of Manufacturing Engineers and the Industrial Technology Institute.

NCMS described itself as a cooperative consortium of some 100 U.S. companies "freed from antitrust inhibitions" that engages in manufacturing research. The board of directors includes representatives from GM, AT&T, Ford, General Electric Co. and Pratt & Whitney.

"GM is trying to hand MAP over to the NCMS," said one MAP analyst, suggesting NCMS is not exactly welcoming the idea with open arms. He added that GM has 35 full-time people — representing a total of about $2 million in salary — dedicated to MAP.

PATRICIA KEEFE

Government presses GOSIP as standard

BY MITCH BETTS
CW STAFF

BALTIMORE — The federal government, weighing in at the Enterprise Networking Event (ENE) with its $17 billion information systems budget, announced that beginning in the summer of 1990, it will require new data networks to comply with the Government Open Systems Interconnect Profile, or GOSIP.

Kevin L. Mills, chief of the systems and network architecture division at the National Bureau of Standards, said GOSIP will become a federal information processing standard within the next two months and will become mandatory for all new contracts two years after that time period.

GOSIP 1.0, which is closely aligned with the Manufacturing Automation Protocol and Technical and Office Protocol (MAP/TOP), was developed by the bureau and other federal agencies to help them assert control over their multivendor distributed systems.

"In many agencies, computer networking is already out of control," Mills said.

Migration confusion

But federal managers said they are confused about how to migrate from existing Transmission Control Protocol/Internet Protocol networks to GOSIP during the two-year transition period.

"To date, I haven't seen anything that's an easy or straightforward way to do it," said Allen Chesley, integration project manager of the Air Force Systems Command at Andrews Air Force Base in Maryland.

While touring the ENE exhibition, Chesley commented, "There are some OSI gateways, but our problem is the sheer size of the installed base." Chesley explained that U.S. Department of Defense networks have thousands of computers based on them and hundreds of thousands of users.

Nevertheless, many federal agencies have already specified GOSIP compliance in recent requests for proposals, vendors said.

The federal agencies are seeking not only open systems interconnection but also software portability via the IEEE Posix standard, noted John F. Leahy III, operations manager at Sun Microsystems Federal, Inc. in Vienna, Va.

"Posix and GOSIP have got to be two standards that don't sit on the shelf," said Duane Fagg, program manager for network management and security at the Naval Data Automation Command in Washington, D.C.

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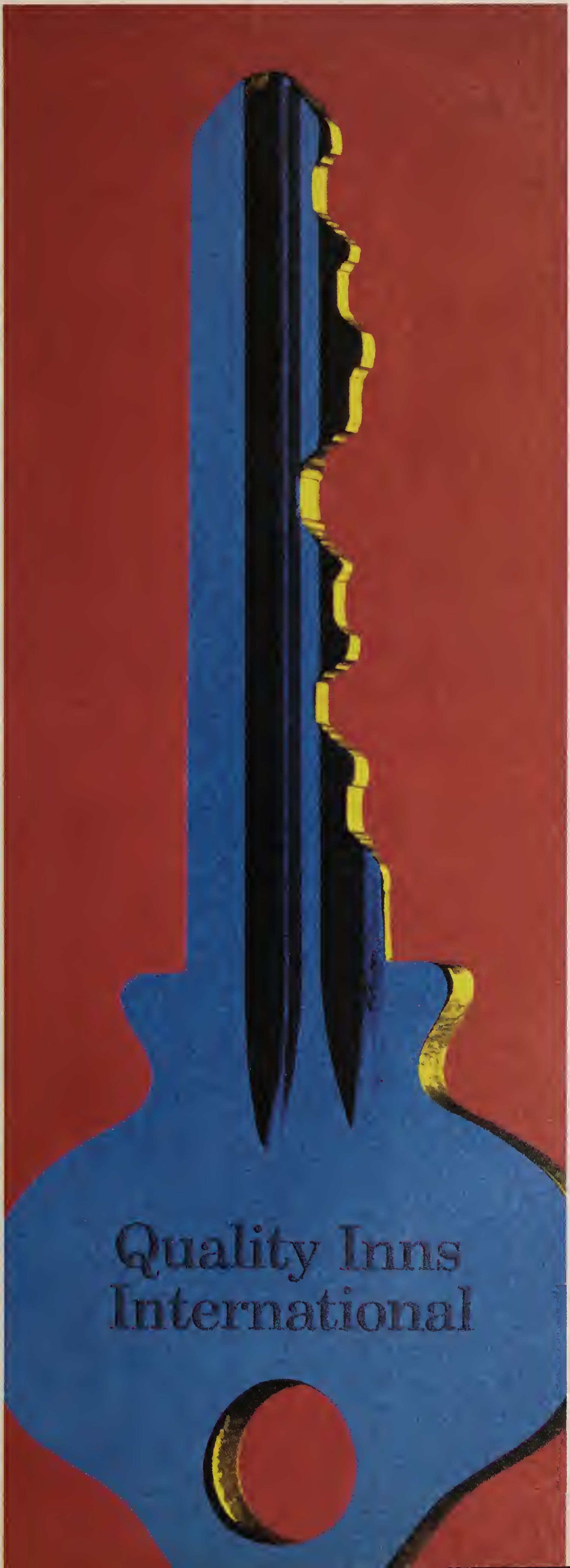

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Copyrights protect whole programs, not individual screens, ruling says

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — In a mild defeat for Apple Computer, Inc., the U.S. Copyright Office ruled last week that a computer program is fully protected by a single copyright and that individual screen displays do not need separate copyright registration.

In legal circles, the decision was seen as a victory for Lotus Development Corp., because the Copyright Office agreed with Lotus that a computer program is an integrated unit. Apple's position — that individual screen displays should be registered for copyrights as well — was rejected.

The ruling came at a time when both Lotus and Apple are suing other companies for alleged infringement of the "look and feel" of certain of their screen interfaces.

Nonetheless, John Sculley, Apple's chairman and chief executive officer, called the decision "a very positive precedent." Apple is currently waging a legal battle with Microsoft Corp. and Hewlett-Packard Co., claiming that screen displays in Microsoft's Windows 2.0 and HP's derivative, New Wave, infringe on Apple copyrights.

The ruling "adds further validity to copyright protection where the expression of ideas is concerned," Sculley said. "As far as the suit goes, that's up to the judge and the jury. But this is obviously a very positive piece of information."

The Copyright Office, part of the Library of Congress, upheld its basic policy of one registration per work, ruling that "our registration practices should discourage piecemeal registration of parts of works." Multiple registrations of parts of works would confuse the public, trigger complex litigation and complicate the administrative process, the ruling said.

Esther Roditti Schachter, a computer law expert and editor of the "Computer Law & Tax Report" newsletter in New York, said the decision will have a positive effect on the software industry because it retains the simplicity of current procedures. "This is a very sound, conservative decision. There was an enormous worry that registration was going to be made unbelievably complex," she said.

The decision resolves some of the confusion that resulted from a hodgepodge of court rulings on the look-and-feel issue, some of which cast doubt on whether unregistered screen displays are protected by the program's copyright [CW, June 6].

Dramatics don't work

The Copyright Office was not swayed by a dramatic audiovisual presentation Apple made at the September 1987 public hearings, in which Apple showed that different code can generate the same display screen and that visual displays are sometimes created by more than one author or company.

"This does not alter the fact that the computer program code and screen displays are integrally related and ordinarily form a single work," the office said.

Obliquely addressing the look-and-feel issue, the Copyright Office said it has a longstanding practice of refusing to register copyright claims for the format of text or images, because ideas and concepts are not copyrightable.

However, if the screen display images consist of original, creative pictorial expressions, then separate copyright may be claimed for the pictures, the agency said. The courts will decide whether copyright is appropriate in these cases, it added.

Yogan Dalal, research and development vice-president at Apple subsidiary Claris Corp., focused on that pictorial aspect. "If someone puts a trash can on the screen, it shouldn't look just like the Mac's trash can, but you should be able to use a trash can."

Thomas M. Lemberg, vice-president, general counsel and secretary for Lotus, said the company is delighted by the decision but characterized it as a procedural issue that "was never meant to deal substantially with what is a copyright."

Microsoft also downplayed the Copyright Office's decision as a "procedural" ruling on how copyrights are filed. "The ruling has no effect on the current litigation with Apple, and it doesn't say anything about a particular program's visual displays," said William Pope, senior corporate attorney for Microsoft.

VDT safety

FROM PAGE 1

small for the results to be "statistically significant."

The increase in pregnancy complications, the researchers said, could not be explained by age, education, occupation, cigarette smoking, alcohol consumption or a number of other factors.

"This is a very important kind of new fact that puts everything else into perspective," said Louis Slesin, editor of New York-based "VDT News." "Before this paper, there were six other studies. In each case, something was found. In each case, researchers said, 'It can't be.' [This study] is the first to say, 'This is what we found. Like it or not, we found it.' "

Dangerous evidence

Reaction to the study was swift, if not predictable.

"Here we have a solid piece of epidemiological evidence, which, while not conclusive, is at the very least a serious presumption of danger," said David Eisen, health and safety director at The Newspaper Guild. About half of the guild's 34,000 members use VDTs.

While The Newspaper Guild suggests that manufacturers provide shielding, both new and retroactive, others suggest changing ergonomics and granting time off for computer operators.

The Computer and Business Equipment Manufacturers Association (CBEMA), a Washington, D.C.-based trade group, labeled the report "alarmist."

"We're not technically concerned about it," CBEMA spokeswoman Charlotte LeGates said. "We are concerned about proving the [technology] guilty without foundation in fact."

LeGates discounted concern about low levels of radiation exposure, saying, "There is more ionizing radiation coming from your wall than your VDT, and so much nonionizing [electromagnetic] radiation from other sources since the invention of electricity."

> "HERE WE have a solid piece of epidemiological evidence, which, while not conclusive, is at the very least a serious presumption of danger."
>
> DAVID EISEN
> THE NEWSPAPER GUILD

"A report like this may very well get OSHA to consider promulgating a standard" for VDT use, said Gabe Gillotti, assistant regional administrator for technical services at the U.S. Occupational Health and Safety Administration (OSHA) in California. He said OSHA is still in the early stages of getting into the issue, "largely because of the lack of studies."

Varied results

The debate over VDT health effects has stagnated in the last few years; only five studies have been released, all of which were inconclusive. Two of those studies claimed no correlation, and one claimed a statistically significant association between VDT use and birth defects but could not separate out other variables such as smoking and stress.

Two studies claimed to have found increases in miscarriages, but one study attributed the finding to stress and the other to a bias in recalling events by its study group.

Past research has indicated that the electromagnetic field and radiation produced by VDTs are too low to affect reproduction, according to the researchers.

But with the results of the Kaiser Permanente study, they questioned that conclusion and called for further investigation, primarily in the area of electromagnetic effects.

Big surprise

"This is a 100% about-face as to what all the other studies have said," said Beth O'Neill, director of Washington, D.C.-based Center for Office Technology, a coalition of users and manufacturers of VDTs.

"Our reaction is surprise," a spokeswoman at Pacific Bell said. "There was nothing previous to this that would cause us concern. But we asked Kaiser for more details to determine whether we should study it further."

The spokeswoman said the health issue had been raised several years ago, but at the time, Pacific Bell was unable to find anything to support the claims of a health hazard.

"It's another example to indicate the debate is still open," said Laura Stock, coordinator of the Labor Occupational Health and Safety Program at the University of California.

Certification service tested

Trial period for COS stamp of approval

BY PATRICIA KEEFE
CW STAFF

BALTIMORE — The Corporation for Open Systems (COS), a consortium of 65 users and vendors that supports the Open Systems Interconnect (OSI) standard, quietly launched a pilot last month to test plans for a product-certification and user-mediation service.

"There's a trial [seal of approval] program being launched now, one aspect of which is a mediation service," new COS Chairman Robert Metcalfe confirmed in an interview here last week at the Enterprise Networking Event (ENE).

Metcalfe, founder of 3Com Corp. and general manager of that company's Distributed Systems Division, said the pilot involves four or five vendors and a few users who will be running some experiments.

Testing products is not the same as certifying them, Metcalfe said. A certification service would provide users with a measure of confidence that a product works and has received a stamp of approval. Test results would be filed and available for users' inspection.

It is unclear whether vendors with certified products will opt to put the COS logo on their product literature. Many COS vendors were "nervous" about the idea, Metcalfe said.

The mediation service comes into play in cases where two COS-certified products will not work together.

However, COS is '"reluctant to dive into liability too deeply," Metcalfe said. Issues still to be worked out include who will do the mediation, who will pay for it and how much it will cost.

In particular, Metcalfe said he is hoping the MAP/TOP Users Group will choose the COS test suites, which test a product's conformance to specific sections of the OSI standard, as its official standard for conformance testing. "Post-ENE, they are ready to set up testing and certification facilities," he said.

COS's Robert Metcalfe

Metcalfe also said he wants to build or strengthen ties with other OSI standards-oriented groups such as the Standards Promotion and Applications Group, a European consortium similar to COS; the Japanese Conference for Promotion of OSI; and the MAP/TOP Users Group. He said he wants the groups to endorse similar implementations. "You don't want to have to test an OSI product multiple times," he said.

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Kroger heads Intel, Siemens venture

BY KATHY CHIN LEONG
CW STAFF

SANTA CLARA, Calif. — Intel Corp. and Siemens AG have announced that they are forming an international computer systems company — dubbed Biin — to address the "mission-critical" computer applications market.

Joseph Kroger, former president and chief executive officer of Sperry Corp. and former vice-chairman of Unisys Corp., has been tapped as president. No other officers have been named at this time.

Analysts eyeing the market said that Kroger, 53, is the best candidate for the position. With more than 25 years of experience, Kroger left Unisys last December and made it clear he would be returning to the industry. "Picking Kroger was a smart move because he has an excellent track record," noted Sandy Gant, an analyst at Infocorp in Cupertino, Calif. Kroger was not available for comment.

Biin spokesman Mike Cox said the company was a natural outcome of a joint four-year computer project. While the two companies worked very closely on the software and hardware architecture, Cox said, Intel had a stronger influence over the very large-scale integration design, and Siemens played a bigger role in software development.

Biin's systems will compete against IBM, Digital Equipment Corp. and Tandem Computers, Inc., Cox said.

Analyst Adam Cuhney of Kidder, Peabody & Co. speculated that the systems will use the 80960 chip set, a 32-bit chip that Intel announced in April. The 80960 was designed for embedded applications in computer products and robotic systems.

Biin's Kroger

According to Cuhney, an entry-level computer will start at 20 million instructions per second (MIPS). Future superminicomputers will include systems running more than 100 MIPS. He predicted that Siemens will supply the proprietary operating system written in Ada and that a Unix shell will be used to support a variety of applications.

Currently, Intel produces a 32-bit parallel processing supercomputer and Siemens resells IBM-compatible mainframes. Biin's future products will include computers that support mission-critical computing applications in areas such as on-line transaction processing and computer-integrated manufacturing, an Intel spokeswoman said.

Production plan

Biin will be based in Hillsboro, Ore., where the Intel Systems Division is located. The company will have European headquarters in Nuremburg, West Germany. Product production in both locations is scheduled to begin before the end of the year. The company will have 200 employees in the U.S. and West Germany.

"Both companies needed something like this," Cuhney said. "Intel needed the expertise of an international computer systems company, and Siemens needed the market presence in the U.S." He added that Intel's intent is to stabilize the company's cyclical semiconductor earnings by becoming a formidable systems supplier.

According to Cuhney, the fault-tolerant system will compete with Tandem, Stratus Computer, Inc. and Sequent Computer Systems, Inc. and will initially be sold through value-added resellers.

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COMPUTERWORLD

**DIGITAL NEWS, 1/25/88, page 58.*

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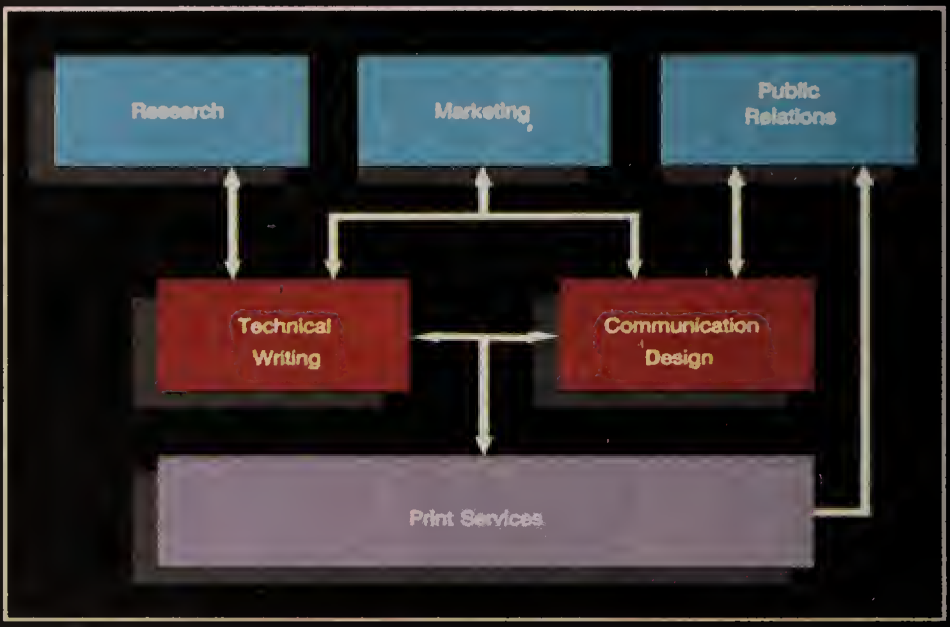

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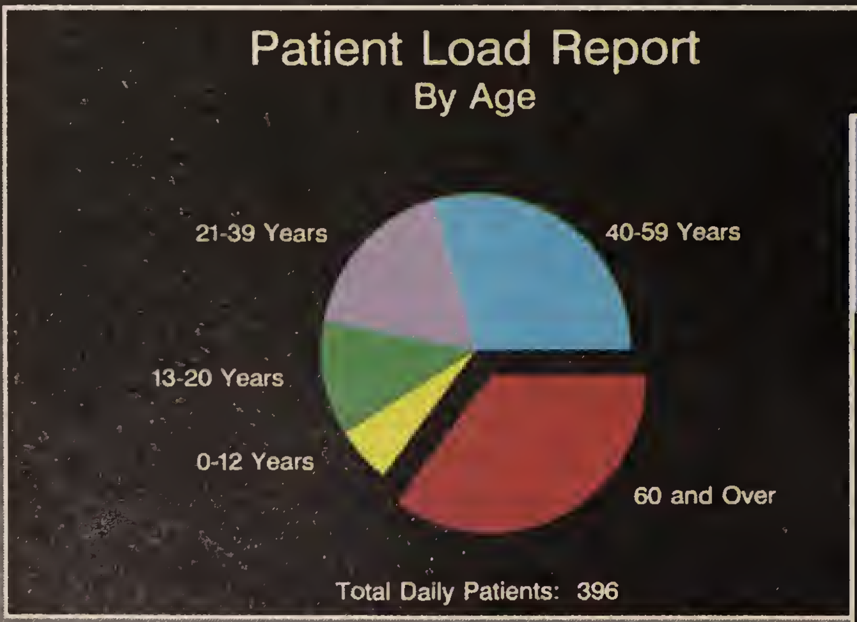

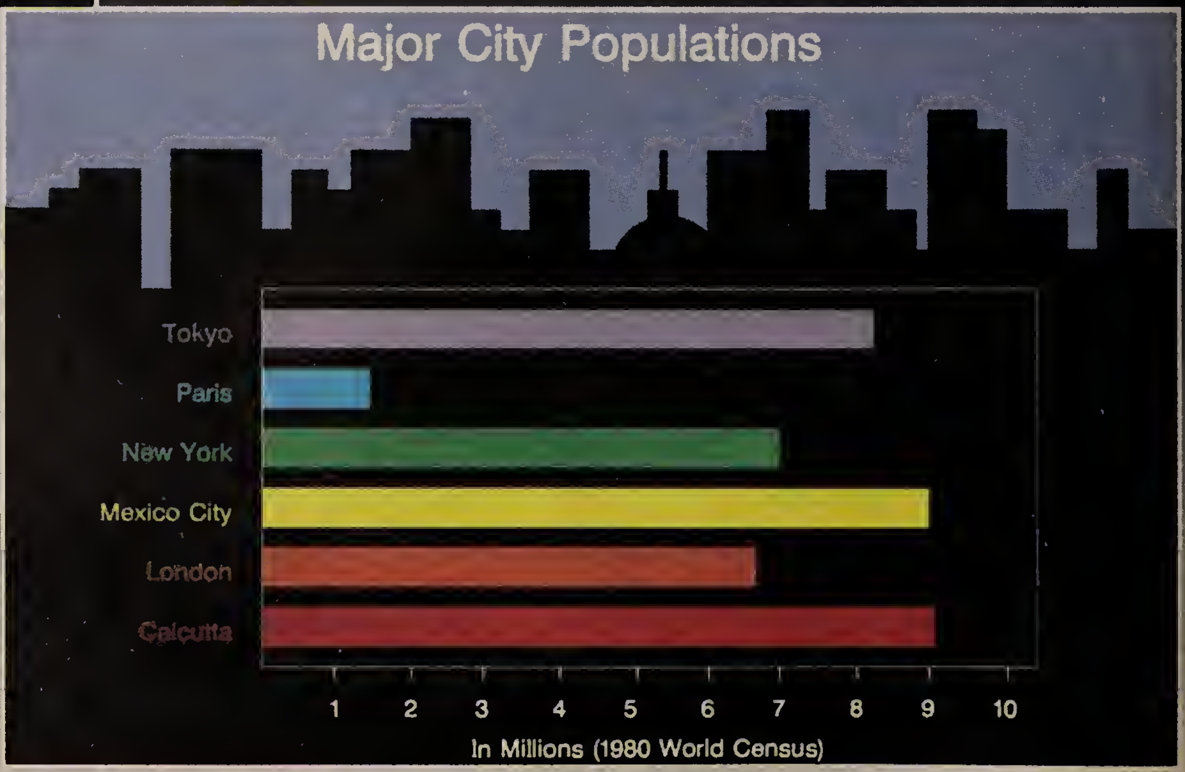

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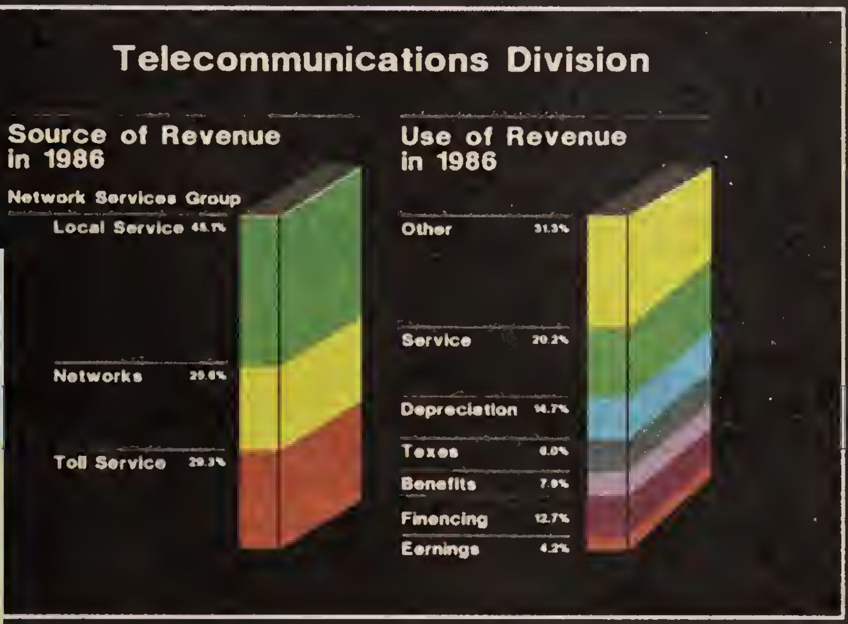

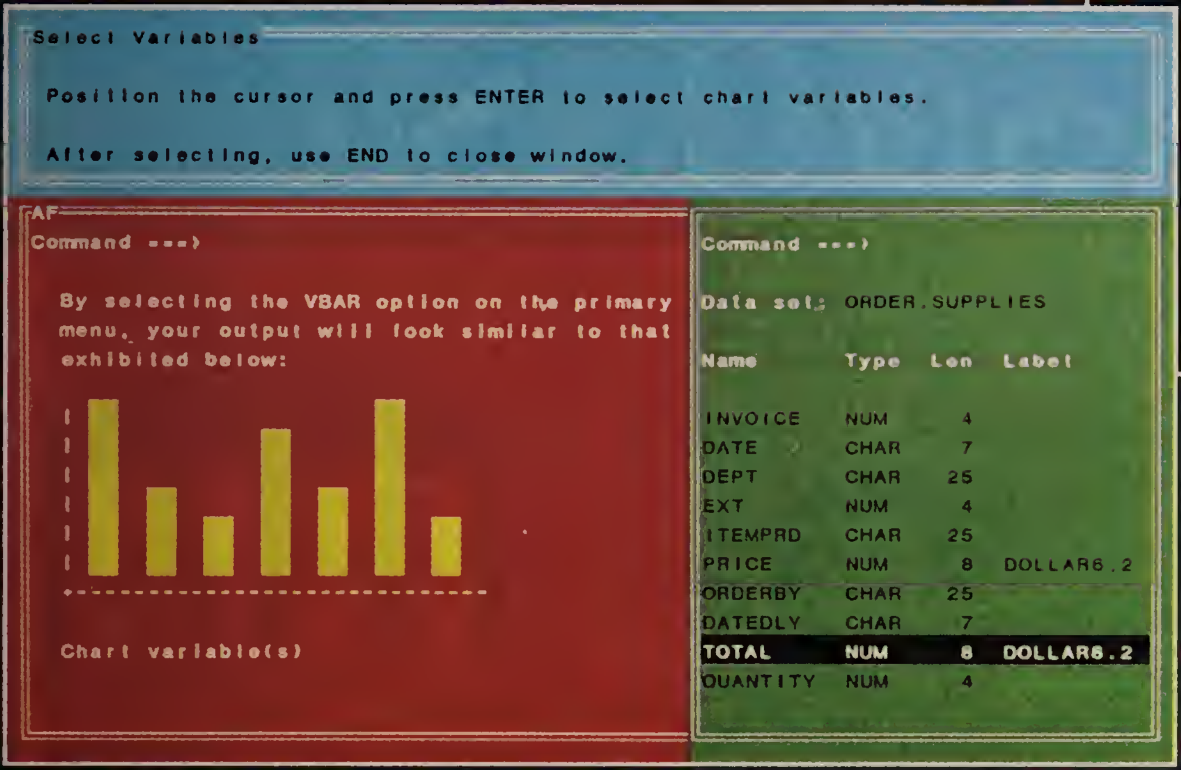

```
Select Variables

 Position the cursor and press ENTER to select chart variables.

 After selecting, use END to close window.
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AF
Command ===>

  By selecting the VBAR option on the primary
  menu, your output will look similar to that
  exhibited below:

  Chart variable(s)
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Command ===>

Data set: ORDER.SUPPLIES

Name       Type  Len  Label

INVOICE    NUM     4
DATE       CHAR    7
DEPT       CHAR   25
EXT        NUM     4
ITEMPRD    CHAR   25
PRICE      NUM     8  DOLLAR6.2
ORDERBY    CHAR   25
DATEDLY    CHAR    7
TOTAL      NUM     8  DOLLAR6.2
QUANTITY   NUM     4
```

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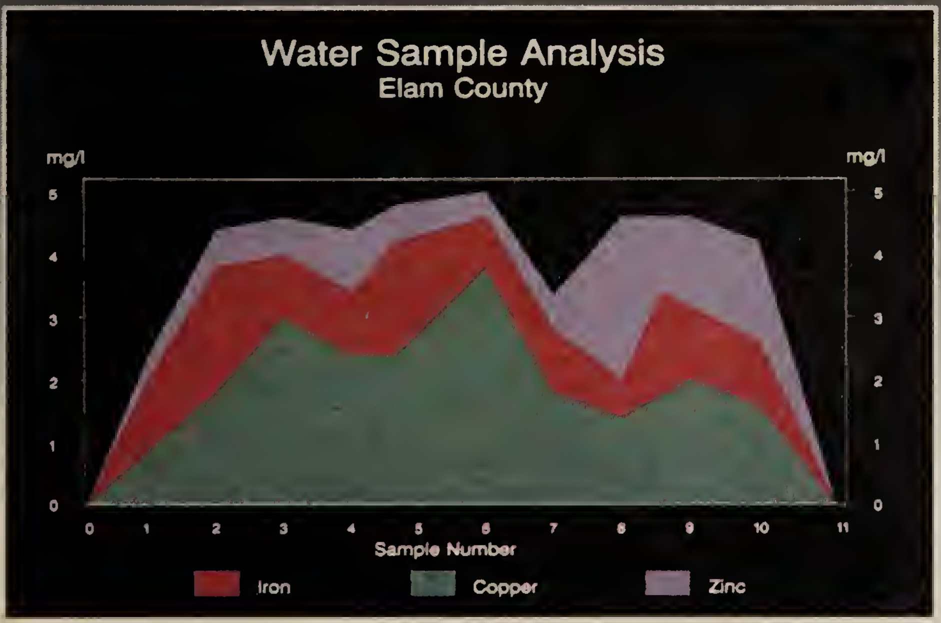

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Apple planting seeds in IBM orchard

BY JULIE PITTA
CW STAFF

ANALYSIS

CUPERTINO, Calif. — With a sense of urgency, Apple Computer, Inc. is seeking to forge the necessary links to tie its Macintosh line into the IBM world and thereby exploit the lucrative corporate market.

As an ongoing effort with Digital Equipment Corp., Apple is taking a two-pronged approach to penetrate the IBM world, promoting those third-party solutions it deems worthy and developing its own connectivity products. DEC and Apple are currently working to develop products that will ease the connection of Macintoshes to DEC's VAX minicomputers. Additionally, Apple has acquired Network Innovations Corp., a developer of Mac-to-VAX tools.

On the IBM front, Novell, Inc. last week unveiled its long-awaited Netware for the Macintosh personal computer, allowing Mac-based local-area networks to communicate with Microsoft Corp. MS-DOS-based LANs. Additionally, Apple announced the acquisition of Orion Network Systems, Inc., a leading developer of software applications that are compatible with IBM's Systems Network Architecture.

"We begin to now address the IBM world with the same enthusiasm that we have been addressing the Digital world," Apple Chairman and Chief Executive John Sculley said last week.

IBM connections key

Sculley ushered in 1988 as the year of networking for Apple. Apple's liaison with DEC was a natural for both companies, since each has enjoyed success with engineering and scientific users. If Apple is to be successful in its push to penetrate Fortune 1,000 accounts, it must offer easy connections to IBM mainframes, the hub of most corporate MIS departments.

Observers pointed out that this year has seen Apple adopt a more proactive stance toward connectivity. In the past, Apple has relied heavily on its third parties to develop solutions, showing a reluctance to embrace one vendor's solution over another's.

"Apple has lacked a cohesive and complete networking package," said Tim Becker, an industry analyst at Lanquest, Inc. "It's left customers shopping around."

Corporate customers have been apprehensive to make large-scale purchases from small, less-established vendors. Products offering slightly different approaches to the same problems leave users hesitant to commit to one product over another.

Apple's endorsements of certain third-party solutions and its own development efforts are encouraging to its corporate customers. However, Apple must bolster its slate of Mac connectivity products before convincing the dedicated IBM customer to take a chance on the Macintosh.

"Apple has to move from being a workstation company to being a corporate computing company," commented Thomas White, president of market research firm Infonetics. "They still have a distance to go. But they're moving in the right direction."

On users' wish lists are a Macintosh version of IBM's Token-Ring network and products that allow the Mac to retain its user interface when connected to IBM mainframes and allow efficient file transfers between the Mac and the host system.

Earlier this year, Apple introduced Macworkstation, a software tool that allows the Mac to retain its user-friendly interface. However, Macworkstation requires adjustments to the host software to be effective, necessitating an investment of programmers' time. Most users said they are investigating Macworkstation's possibilities but have yet to create applications for it.

"What I'd like for Christmas are tools that extend the Mac look-and-feel so that the user doesn't know or doesn't care what he's talking to," said Timothy Turnpaugh, executive vice-president of the operations group at Seafirst Bank, a Bankamerica Corp. subsidiary. "Can you imagine how that could bring down my training costs?"

Like other customers, Seafirst is experimenting with Macworkstation. "The thing that hangs me up is you're talking about rewriting code on the mainframe," Turnpaugh said. "I'd rather have the Mac driving the mainframe."

Turnpaugh said he is pleased with Apple's participation in the networking market. "The advantage Apple brings to the table is consistency," he explained. "It's easier to deal with them. I'm glad that they're getting deeper into it."

Michael Cromar, director of information resources at American President Companies Ltd., said his company is also developing on the Macworkstation, a product he said is desirable, but not essential.

"There are a thousand things to do on a personal computer, one of them being connecting to a mainframe," Cromar explained. "The mainframe is not the center of the universe as it once was."

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Staff Isolation

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If you think it's what's up front that counts, you'll probably be satisfied with one of the "application generators" that pass for CASE tools. But most of these simply generate code—not complete applications—and they'll do nothing to ease the maintenance backlog that can represent up to 70% of your total application life cycle cost. So up front is the **only** place they'll save you money, if they save you money at all.

Speculation

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JOE'S CASE SHOP

Novell opens PC door for Macintosh

DOS link provided through much-anticipated Netware for Mac, Appletalk adoption

BY JULIE PITTA
CW STAFF

SAN JOSE, Calif. — Novell, Inc. last week announced its long-awaited Netware local-area network software for Apple Computer, Inc.'s Macintosh personal computer at a joint press event here.

The announcement was one of two indicating Apple's intent to provide more connectivity solutions enabling Macintoshes to be integrated into IBM environments. In some cases, Apple will offer its own products; in others, it will bless third-party solutions like Novell's.

Also last week, Apple said it had acquired Orion Network Systems, Inc., a Berkeley, Calif., developer of applications software compatible with IBM's Systems Network Architecture (see story page 14).

"It gives us an entry point into the MS-DOS and OS/2 worlds with integrated solutions including a token-ring gateway," said Apple Chairman and Chief Executive Officer John Sculley. An estimated 220,000 Netware operating systems have been installed worldwide.

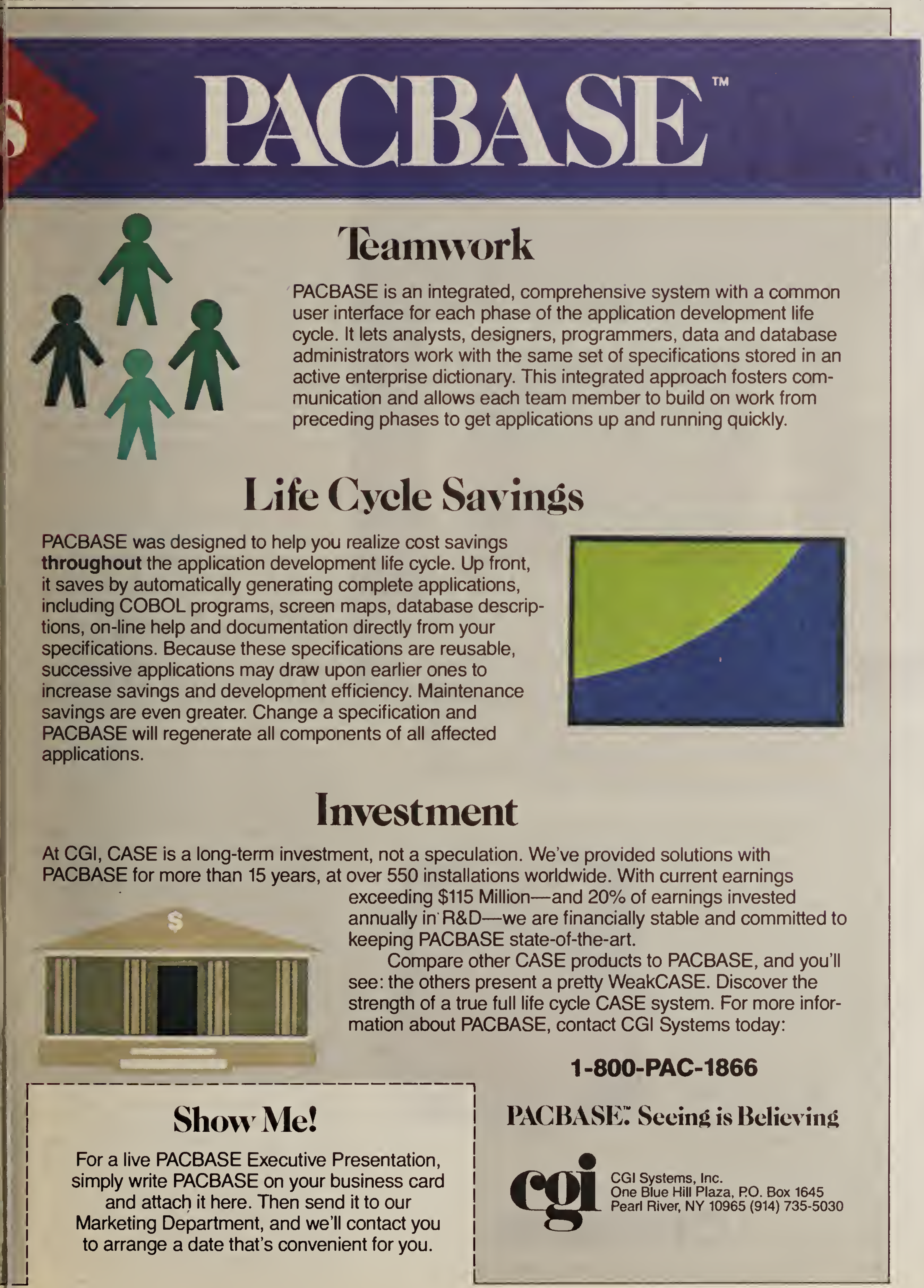
Appletalk key

Key to Novell receiving Apple's blessing is its adoption of the Appletalk filing protocols. "Apple is sending the message that it will bless companies that don't mess with its screen and environment," said Brad Baldwin, an industry analyst at Dataquest, Inc. "In essence, they're saying, 'You better come out with products that allow us to retain our identity or we'll do it ourselves or look elsewhere.' "

Netware for the Mac allows full compatibility between Netware LANs, Macintoshes and the Appletalk network system, Novell claimed. Using Netware for the Mac and Netware Version 2.15, Appleshare and Netware file servers can reportedly coexist, sharing network management and security, data files and other Netware services.

A number of third-party developers, including Ashton-Tate Corp., Lotus Development Corp. and Odesta Corp., said they will support Netware for the Macintosh and the new Version 2.15.

Netware for the Mac and Netware 2.15 will be available through Novell-authorized resellers.



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Apple juices Mac operating system with speed, tools

CUPERTINO, Calif. — Apple Computer, Inc. announced Version 6.0 of its Apple Macintosh System Software last week, injected with new capabilities such as increased speed.

With this most recent version, users are able to automate repetitive tasks that previously required several steps or movements with a program called Macromaker. Macros can be created to be local or global. Recorded macros can be viewed by name, assigned keystroke or information.

Enhanced multitasking Multifinder capabilities were added as well. Under Multifinder, application documents can be opened directly from the user's desk top.

The software's notification manager was updated with more alerts to notify users that background tasks may require attention, Apple said.

Magnified screen

Other additions include Closeview, a screen utility that allows users to magnify the Macintosh screen display from two to 16 times its normal size, and a utility called Map that enables users to determine the time and distance between locations worldwide.

Version 6.0 will sell for a price of $49. Updates are available through Apple dealers, users groups and electronic distribution services.

The new version is compatible with Macintoshes having at least 1M byte of memory, the company said.

System Software 6.0 and a Hypercard 1.2 personal tool kit will now be bundled in the box with every Macintosh sold, according to Apple.

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Diskless units on the rise

BY ALAN J. RYAN
CW STAFF

IBM did not announce a diskless version of its low-end Personal System/2 Model 25 this month, as many had predicted it would. But it appears more than willing to consider filling special orders in the embryonic market of stripped-down personal computers intended mainly for network use.

"If a customer came to us with a serious proposal, I'm sure we would consider it — on a special basis," IBM spokesman Scott Brooks said. The company has reportedly produced diskless PS/2 Model 50s for some of its large accounts [CW, Feb. 1]. Earlier this month, IBM announced a version of its Model 25 that incorporates an IBM Token-Ring card for network uses, but the unit still contains a floppy drive.

Currently, the diskless workstation, or processing terminal, market is in its infancy, said Greg Blatnik, director of terminal services at Dataquest, Inc. However, "we consider it to be one of the emerging growth areas," he added.

The market for diskless units has been confined primarily to niche product offerings tied into applications, said Clare Fleig, an analyst at International Technology Group in Los Altos, Calif.

Users at companies moving to diskless technology said cost is a motivating factor and that features such as security are an added incentive for moving to the networked units. That is why these cousins of desktop computers will grow in the marketplace at a rate of more than 100% annually, according to Dataquest.

For Tim Crowell, vice-president responsible for the trust department's local-area network at the First Republicbank Dallas NA, saving money was the reason he began buying medialess 3Stations from 3Com Corp.

Previously, Crowell said, "as our network grew, it grew slowly because the cost of adding new stations on was fairly expensive." He found out, however, that "we could get a couple of 3Stations at the same price we could get on a stand-alone station with a floppy in it."

A user at a New York-based insurance company, who declined to be identified, said cost was the motivating factor for his company as well.

"We were saving on the order of $500 to $1,000 per PC," he said. The units were placed on desks of high-level clerical workers within the company.

A secondary reason most companies interested in diskless units look at them is for security. One user at a large New York financial institution said that with a large influx of seasonal temporary help, it was important that users at the company not be able to print out classified information onto floppies.

Market heating up

Companies that have gambled on diskless workstations say the market is rapidly shaping up and that more players are quickly joining in. Most of these new players offer products based on Intel Corp.'s 80286 microprocessor.

Vern Yates, vice-president and general manager of NCR Corp.'s PC division, said NCR moved to the network node market in 1986. The company offers a diskless unit but also offers floppy- and hard-disk versions of the products that are called the 3390 and 3392.

"You get cost-effective by taking as much out of what you would call a typical PC as you can," Yates said. These more compact workstations run with a smaller cabinet and power supply and do not need the expansion capabilities that increase price and size. The units are dependent on a communications interconnect and can not perform functions without being connected.

Yates estimated the market will be less than $1 billion in 1987 but could grow as high as $8 billion or $9 billion by 1991.

IBM to bundle Microsoft Works

REDMOND, Wash. — Microsoft Corp. and IBM are teaming up once again, this time to jointly promote IBM's low-end Personal System/2 Model 25 microcomputer and Microsoft Works.

According to the companies, individuals who purchase a PS/2 Model 25 through an IBM dealer can obtain a free copy of Microsoft Works. The software program, which retails for $195, combines a word processor, a spreadsheet with charting and a data base with reporting and communications capabilities. It is targeted mainly for small-office, school or home use.

Priced at $2,139, the Model 25 is IBM's entry-level PS/2 machine and does not have the company's proprietary Micro Channel architecture. It has an Intel Corp. 8086 microprocessor; a 3½-in., 720K-byte disk drive; a 512K-byte system board memory; and two expansion slots. IBM recently announced the availability of a 20M-byte hard-disk version.

Microsoft Works requires a PS/2 or compatible with at least 384K bytes of memory and two 360K-byte disk drives, one 720K-byte disk drive or a hard disk drive.

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Additionally, enhanced automation command processors in AutoMate/MVS can be used for more sophisticated automation to increase system availability without operator intervention.

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Apple buys Orion, aims to mine SNA

Acquisition seen to be essential step as Apple wedges foot in corporate America's door

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. last week acquired a developer of IBM Systems Network Architecture (SNA) software in an effort to broaden its strategy for penetrating IBM-dominated Fortune 1,000 accounts.

The acquisition — for an undisclosed sum — of Orion Network Systems, Inc., a Berkeley, Calif.-based software developer, adds a much-needed component to Apple's networking strategy, observers said.

Apple has lacked its own solutions for integrating its Macintosh microcomputers into IBM environments, observers also said. "What Orion brings Apple is practical applications," said Thomas White, president of market research firm Infonetics. "It means products rather than tool kits."

Apple must be able to connect its Macintosh personal computers to IBM mainframes if it hopes to build large corporate accounts, industry analysts said.

"We spent the first half of the year concentrating on products allowing us to connect to the Digital world," Apple Chairman and Chief Executive Officer John Sculley said. "We obviously want to be able to connect to the IBM world."

In January, Apple announced a joint development agreement with Digital Equipment Corp. that would give birth to co-developed products as well as foster third-party solutions enabling the connection of Macintoshes to DEC's VAX line of minicomputers.

Four-year proof

After purchasing Orion's software for the last four years, Apple concluded that it was a key technology that should be brought in-house.

Apple and Orion cooperated on the development of MacAPPC, a software implementation of SNA protocols LU6.2 and PU2.1, allowing Mac applications to communicate with hardware from IBM and other vendors.

Discussions between the two companies commenced six months ago.

Other Orion customers include Apollo Computer, Inc., AT&T, Ing. C. Olivetti & Co. and Prime Computer, Inc. Both Sculley and Orion President Paul Rampel said Orion will continue to service its existing OEM customers and will aggressively pursue new business.

Orion will operate as a wholly owned subsidiary of Apple, with its management team remaining intact. Three Apple representatives will be added to Orion's board. Jean-Louis Gassee, Apple senior vice-president of research and development, has been appointed chairman of the board.

IBM combines product data into on-line service

BY JAMES DALY
CW STAFF

ORLANDO, Fla. — IBM users puzzled about the whys and wherefores of their machines' operation now have an alternative to scratching their heads.

With the introduction of IBMlink, users seeking product specifics can tap into an on-line electronic service that provides access to a library of IBM hardware and software product overviews, specifications, functions, prices, schedules and delivery dates.

At IBM's recent three-day Executive Forum, Vice-President Edward Lucente downplayed the notion that the service will compromise the user-vendor connection. "IBMlink isn't a replacement for human interaction," he said. "Our goal is to provide customers with the information they need to ask the right questions. At the same time, it will give our people more time to work with customers."

Single source

IBMlink essentially boils down more than 30 different on-line sources of product, technical and billing information that the firm has previously provided. Through the service, customers at remote locations can tap into the one motherlode of information through the worldwide IBM Information Network by dialing a phone number or connecting through a host mainframe to the services.

Although there is no separate charge for IBMlink, a potential user must first subscribe to the IBM Information Network, which costs $1,800 a month and includes a variety of additional services.

IBMlink is set to be available on a limited basis next month and to be accessible through most IBM computer terminals attached to mainframes.

What do we call an organization that insists on hard network comparisons and live evaluations before buying?

Complexity of battle software would doom SDI in actual war

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — President Reagan's proposed Strategic Defense Initiative (SDI) would probably be doomed to "catastrophic failure" in its first real war because of inevitable errors in the extremely complex battle management software, according to the U.S. Congress Office of Technology Assessment (OTA).

The big problem lies in the difficulty of testing the software using only simulations. Large fault-tolerant software systems — such as the public telephone network — become dependable only after extensive operational use and debugging, the OTA warned in a major study released last week.

"In the OTA's judgment, there would be a significant probability (that is, one large enough to take seriously) that the first (and presumably only) time the ballistic missile defense system were used in a real war, it would suffer a catastrophic failure," the study concluded.

The proposed satellite-based defense system would be the most complex computer system ever developed. The battle management system would have to track hundreds of thousands of objects and decide how and when to attack a multitude of targets with little or no human intervention, the OTA said.

Not even in peacetime

In fact, SDI software may not be able to pass even peacetime tests because of its complexity, the changing nature of system requirements and the novelty of the new technology to be controlled, the OTA said.

For example, the OTA noted that large, complex systems that undergo continuous change sometimes reach states in which new software changes introduce errors at a greater rate than they remove them.

The Pentagon's SDI Organization, however, said it sees software problems as challenges to be overcome rather than as insurmountable obstacles. The group is supporting some research in software engineering, but the OTA said the SDI Organization's budget for software research is minuscule.

In a snapshot of the $276 million budget for battle management in 1987, the OTA found that only 2% of the budget is spent on software verification, 1% on fault tolerance and 1% on software engineering technology development.

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For production, IMS shown to still top DB2

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Surveys by two of the nation's largest DB2 users groups disclosed last week that only a small number of DB2 users in Chicago and New York rely on the IBM relational data base management system for their transaction processing applications. IBM's IMS product is still outpacing DB2 as a production DBMS, the surveys showed.

"A large group is not yet using DB2 as a production engine," said Howard Fosdick, president of the Midwest DB2 Users Group and a DB2 data base manager at Amoco Corp. "The vast majority are still using IMS as their primary DBMS and using DB2 as a query system or a development system."

The Midwest DB2 Users Group, which surveyed 350 users, and the Knauer DB2 Users Group in New York, which surveyed 115 users, reached similar conclusions, Fosdick said. The results were presented to the Midwest users group last week.

The New York survey showed that 50% were using DB2 in development projects, while 40% were using it for production. Another 10% in the New York survey used DB2 for pilot projects.

Of users running DB2 production systems, the Chicago survey showed the following:

- 65% used DB2 for end-user query.
- 53% were installing transaction-oriented systems.
- 35% were downloading IMS data to DB2.
- 28% planned to replace IMS with DB2.

Surveyed users reported that DB2 application response times seemed reasonable but that DB2 housekeeping was time consuming, said Linda Garcia-Rose, coordinator for the Knauer DB2 Users Group. One New York installation needed 299 CPU minutes (543 real-time minutes) to load a 15 million-row DB2 table and index. Another table with 2.5 million rows required 30 CPU minutes (80 real-time minutes) to load the index.

Reorganization of DB2 tables can take hours, users said. One New York user found that it took three hours to Reorg a 2.3 million-row table under DB2.

EDITORIAL

Better to be safe

LIKE IT OR NOT, the evidence pointing to a connection between health hazards and working on VDTs is mounting.

This is not to say or even suggest that VDTs themselves are to blame. But for employers, manufacturers and workers to not be at least concerned about the possible health hazards linked to prolonged VDT use is irresponsible and foolhardy.

The most convincing piece of research into a possible link between VDT use and health problems (see story page 1) found that women working on VDTs 20 hours per week or more had an 80% higher risk of having a miscarriage than nonusers.

Researchers were quick to point out that while the size of the study holds some statistical significance, other factors in the workplace or in clerical workers' modus operandi could have caused the abnormal rate of miscarriages.

Several things are needed — and needed immediately. One is a broad-based commitment to embark on more intense, in-depth research to confirm the study results. If these studies prove conclusive, then further research should be hatched to determine the cause of the abnormal miscarriage rate.

In addition, employers should take it upon themselves to recognize that a potential problem exists for the nearly eight million female VDT workers of child-bearing age.

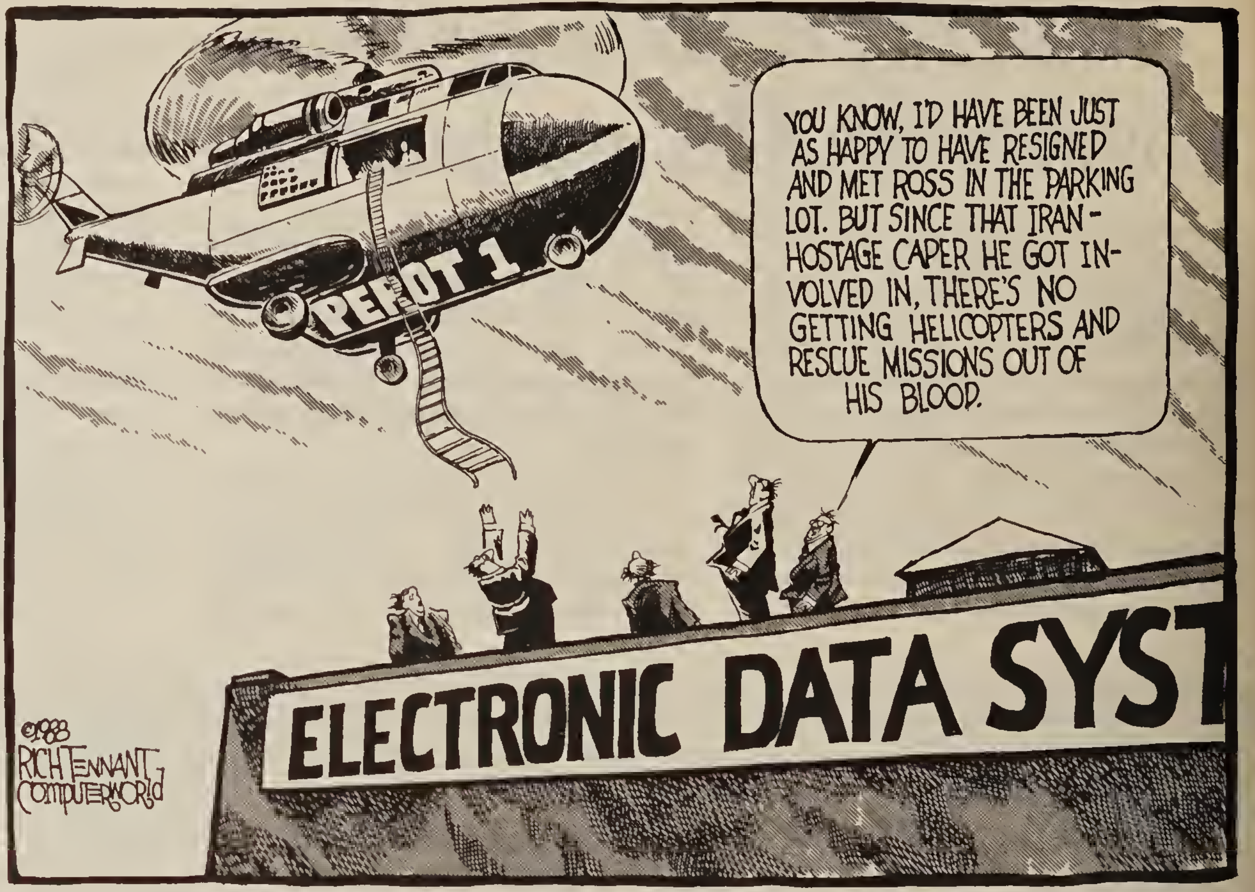
Given the number of workers we are talking about, prophylactic action in the workplace seems logical and can take many forms, including improvements in working conditions, lighting and seating, as well as making proper shielding available for those who ask for it. Ironically, radiation emitting from computer terminals is not high on the list of suspected culprits as the cause of a host of possible work-related maladies, except in VDT-dense environments.

Unfortunately, response to the recent study from both sides of the VDT health issue has been predictably irresponsible. Women's groups referred to the study as "damaging *evidence*." Perhaps they know something even the researchers do not.

On the other side of the issue, a spokeswoman for the Computer and Business Equipment Manufacturers Association called the report "alarmist." That sounds more like a response from the tobacco industry to another one of those pesky studies linking smoking to heart disease.

Instead of beating an issue of great importance into uselessness with such irresponsible yelps, all concerned parties need to get behind a unified effort to thoroughly research the matter. Each group should contribute to a general fund to conduct research, calling for matching funds from the U.S. government. Perhaps the issue could be explored on an international front.

In this way, everyone puts aside their self-interests and does something right for millions of women and their future children.


PEROT 1
YOU KNOW, I'D HAVE BEEN JUST AS HAPPY TO HAVE RESIGNED AND MET ROSS IN THE PARKING LOT. BUT SINCE THAT IRAN-HOSTAGE CAPER HE GOT INVOLVED IN, THERE'S NO GETTING HELICOPTERS AND RESCUE MISSIONS OUT OF HIS BLOOD.
ELECTRONIC DATA SYST
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LETTERS TO THE EDITOR

Still struggling

Great editorial "For Shame" [CW, April 25]. The struggle between compatibility and competitive advantage goes on. Poor standards community. Poor users.

Herbert R. J. Grosch
President
Association for Computing Machinery
Switzerland

Stands by 80286

I am writing regarding a statement made by Alan Radding in "Edging toward power machines" [CW, April 11]. Addison-Wesley Publishing Co. is not "squarely in the 80386 world." We agree that, in the long run, Intel Corp.'s 80386 is likely to be a more strategic product than its 80286. Nevertheless, Addison-Wesley's user services configuration recommendations have uniformly been for the less expensive IBM 80286-based Personal System/2 Models 50 and 60 rather than the 80386-based PS/2 Model 80.

Robert E. Petersen
User Services Manager
Addison-Wesley Publishing Co.
Reading, Mass.

The ideal world

Bravo! Congratulations on the first of hopefully many visionary trips into the world of software development seen in the article "From anarchy to architecture" [CW, April 25].

Fred Viskovich had his finger on the issues that must be resolved if businesses are to survive rather than eventually choke to death on today's software development techniques. And, if the techniques that produce poor-quality software are not fatal, then business will surely drown in computer code.

In the ideal environment, systems developers will spend their time dealing with business problems rather than data processing problems. As developers arrive at a consensus on requirements, the development system will be creating the application. Developers will arrive quickly at conclusions, test them by running the system and return either to make corrections or continue development. The requirement to produce endless diagrams, write piles of specifications and develop systems on a foreign language will be gone forever.

John E. Lee
Executive Vice-President
Exsys, Inc.
New York

Not alone

The article on telecommuting [CW, May 2] was an excellent report on California's rationale and plans for its telecommuting pilot for state government employees. It clearly showed that telecommuting has moved beyond the novelty stage and is an accepted workplace option.

I would like to correct an impression that may have been left by my comments. While many California employers and their employees have benefited from work-at-home programs, I have seen evidence that this is not just a West Coast phenomenon. The smog and traffic for which parts of California are known are also present, unfortunately, elsewhere in the country.

Gil E. Gordon
Editor
"Telecommuting Review"
Monmouth Junction, N.J.

A believer

Your attack on AT&T and Sun Microsystems, Inc. [CW, April 18] as partners in establishing a graphical interface to be included in the Unix standard shows narrow-mindedness and a lack of common sense.

For the time being, and probably for the near future, AT&T will continue to define Unix. This product has grown immensely under its direction and achieved sufficient status and recognition to convert followers. I am unaware that these converts were promised equal voting rights in determining product development.

I am glad AT&T went forth on a graphical interface instead of becoming involved in the time-consuming and probably impossible task of allowing the direction of Unix to be determined by popular vote. It is unlikely, given the huge following, that any more companies would end up any happier.

The bottom line is that a graphical user interface was needed now, not after two years or so of haggling. AT&T found one that would suffice and went with it. I am sure that the reputation of Sun gave the company the same warm feeling it gave me in knowing that the interface would continue to evolve.

Randall K. Cullinan
President
Risc, Inc.
Richmond, Va.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Unearthing MIS matrix roots

Throwing theory aside, in the end it all comes back to centralization

JOHN KIRKLEY

For some time, conventional wisdom has decreed that as MIS organizations mature, they move from a centralized to a decentralized structure. This seemingly inevitable evolution has been discussed at length in the trade press and backed by studies from various research houses.

One recently issued report from John Diebold & Associates admitted to uncertainty about how MIS would evolve. The researchers extrapolated that the function of central MIS would reflect the drift of computing power out to the end-user community. MIS would wind up managing telecommunications, supporting the corporate offices, establishing standards and procedures, maintaining the corporate data base and spending a good deal of time developing a new role as facilitator and consultant to end users.

It all sounds reasonable. You can probably think of organizations undergoing this metamorphosis. Certainly the pressures brought about by increasingly friendly applications development languages, the horsepower of personal computers and workstations, the widespread use of PC LANs, the first stirrings of real distributed data bases and the generally recognized need for MIS to drop its overly territorial attitude are all contributing to decentralization.

And so clarity seems to have been attained. MIS's course is clearly charted.

But wait.

Just when you thought it was all sorted out, a group of researchers at the selfsame Diebold, including Senior Vice-President Mark Klein, unearthed a major anomaly.

Klein and his colleagues analyzed the results of a survey of the evolution of the MIS function in more than 50 gas and electric utilities. In the as-yet unpublished report, they classified these companies as to their level of MIS maturation.

Although the Diebold researchers did not make this analogy, their categorization of MIS functions as immature, maturing and mature sounds suspiciously like the cycle we humans go through. The comparison is even more apt in view of their comment that the level of maturity does not depend on the organization's age but rather on its behavior.

Maturation criteria ranged from the MIS executive's place in the corporate hierarchy to how MIS costs are handled — as overhead (immature), allocation based on formula (maturing) or full chargeback (mature).

When the Diebold folks analyzed the data, the thesis that organizations inevitably move toward decentralization suddenly came a cropper.

The researchers found that as the MIS function moves from immaturity to the maturing stage, decentralization takes hold. But decentralization seems to be an interim condition, perhaps brought on by the user's dissatisfaction with the immature or adolescent behavior of the still-developing MIS function. As MIS organizations move into their mature phase, they tend to become highly centralized.

The implications are intriguing. Decentralization, at least in the gas and electric business, seems to be a passing state. MIS does not, in the long haul, have to give away the shop piece by piece until only an elite group of consultants remains.

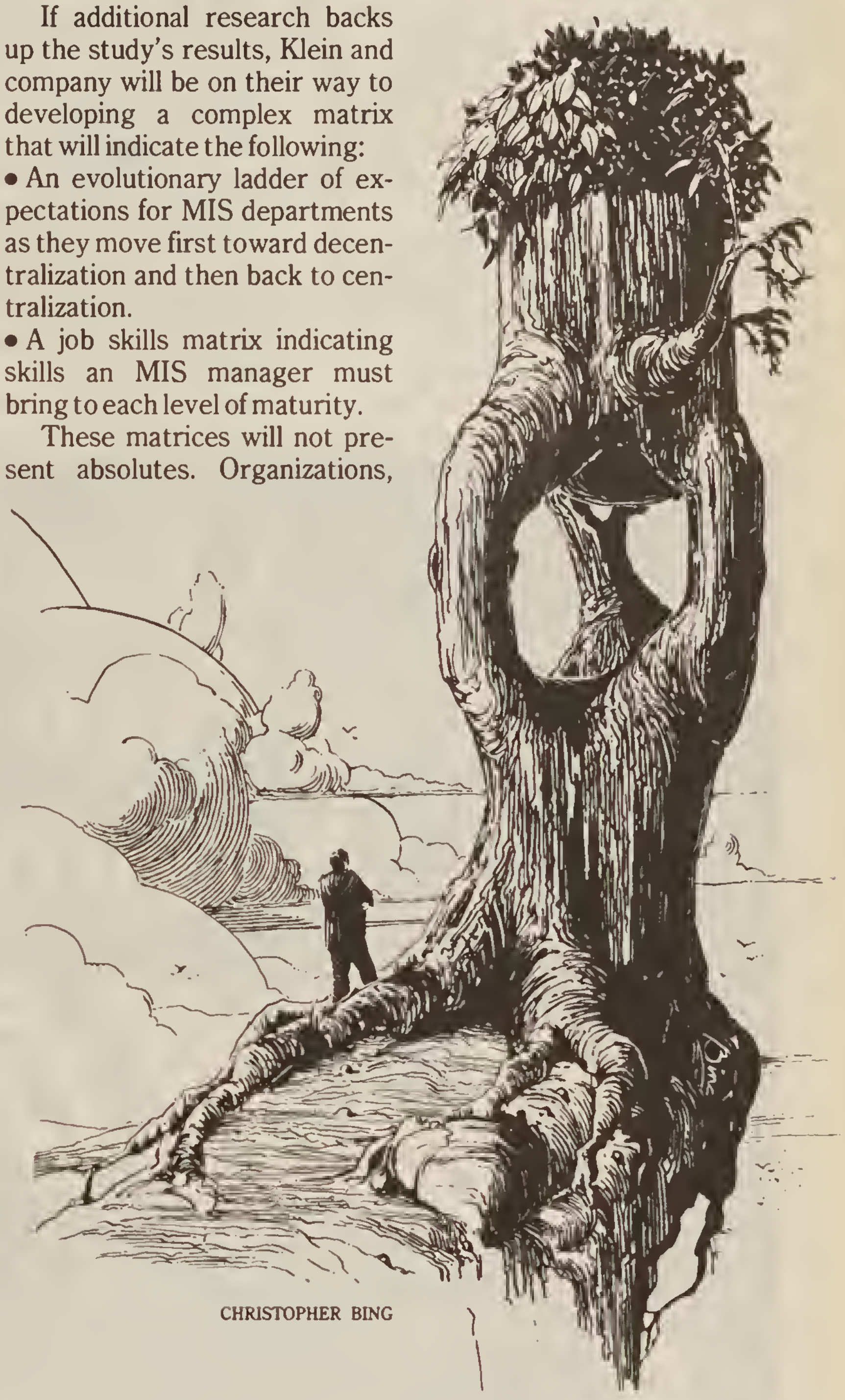
If Klein's findings hold true for other industries, it appears that MIS organizations undergo a series of complex transformations. At each stage, the function must be managed differently. Naturally, MIS managers must be prepared to learn new skills and management methods along the way.

For example, in an immature organization, MIS will not manage the telecommunications function. But when the department has reached maturity, it handles both voice and data communications. In this state, the MIS executive becomes an officer of the company and reports to the chief executive officer or president.

If additional research backs up the study's results, Klein and company will be on their way to developing a complex matrix that will indicate the following:

- An evolutionary ladder of expectations for MIS departments as they move first toward decentralization and then back to centralization.
- A job skills matrix indicating skills an MIS manager must bring to each level of maturity.

These matrices will not present absolutes. Organizations, like people, are a complicated mix of mature and immature characteristics. On a case-by-case basis, both burst the bounds of their statistical niches.



CHRISTOPHER BING

Kirkley is a computer industry writer, editor and consultant based in Warwick, N.Y.

Truly distributed DBMS hard to develop — even for IBM

SHAKU ATRE

Two features the market has repeatedly asked from IBM pertaining to DB2 are referential integrity and an active integrated data dictionary and directory.

Referential integrity was announced in April as a major feature of DB2 Version 2. With this feature, it is possible to implement business rules. For example, a business rule for a bank may be to not delete a customer record from the customer table if an outstanding account record remains for the same customer in the account table.

Of course, business rules must also be conveyed to DB2. Before the Version 2 announcement, application programmers had to code business rules in each of the programs. Now the data base administrator implements these rules in DB2's data dictionary, called the DB2 Catalog. Each program now validates the rules against the catalog.

The specific business rules regarding customer and account tables will be stored in DB2's catalog and acted on by DB2 whenever a program attempts to delete a customer with an outstanding account. This ensures data integrity.

Now that the one shoe of referential integrity has dropped, the question remains of the other — Repository. This is supposed to play the role of data dictionary, not only for one licensed copy of DB2 or for multiple copies but possibly for other systems as well.

Repository should set the stage for IBM Systems Application Architecture (SAA), which, in turn, is supposed to provide portability between IBM's disparate hardware and operating systems. SAA supposedly will connect the three hardware platforms of 370-based systems, System/36 and 38, the soon to be announced Silverlake and Personal System/2s.

Repository is supposed to be the glue to stick everything together, including the supported languages, application generator programs, system management tools and performance monitoring facilities. Application programs can be developed by using fewer lines of code than in Cobol programs.

Repository should provide the application program interface for connecting Silverlake programs with Silverlake's operating system or PS/2 programs with the aid of OS/2 Extended Edition programs. The language connecting all software will be SQL. The DB2 programs on the 3090 Model E mainframes will be connected with System/36 and 38 and/or PS/2 programs.

IBM desperately needs that connection capability in order to boost mainframe sales. It had hoped that a majority of the installed 20 million microcomputers would be connected to 3090s, but that hasn't happened. Microcomputer sales are increasing at the rate of 20% per year, mid-ranges at 10% and mainframes by only 4%.

Repository will store data for just about everything under the sun for a particular installation and will use DB2 for its implementation, boosting DB2 sales. The feature may support multiple catalogs of the many DB2 copies as well as data dictionaries implemented for IMS.

This means Repository is not really a DB2 announcement but an SAA announcement. It will connect the three hardware platforms of 370, System/36 and 38 and PS/2 with the operating systems MVS/ESA, Silverlake's operating system and OS/2.

What about VM/XA, another SAA operating system? An announcement for SQL/DS, which runs under VM/XA, is expected by the end of the year. An announcement for referential integrity for SQL/DS might be in order as well.

Now what about ESA for DB2? The Version 2 announcement of DB2 spent so much of its arsenal on referential integrity and operational enhancements that ESA was not even mentioned for improvement in performance with its use of High Performance Space.

Use of Hiperspace could be the feature of DB2 that will make the independent DBMS software vendors scramble for some characteristics to stand out. These features could be their active data dictionary and directory, fourth-generation language and application-enabling computer-aided software engineering tools where IBM still lags.

With the announcement to connect the disparate hardware of 370, Silverlake and PS/2, the announcement of providing a single system image is not too far behind. A single system image is the main theme of the distributed data base environment R Star. It is the prototype IBM has been working on for years.

A distributed data base management system is a tough nut to crack — even for IBM. The necessary features to make a DBMS truly distributed will be announced piecemeal in the next three to four releases of DB2/MVS and "DB2/VM."

Atre is president of Atre/Computer Assistance in Rye, N.Y., a consulting and training company specializing in relational data base management systems.

BOOK REVIEWS

IBM's SAA — at a more intimate level

The Making of the Common View
By Michael Killen

The idea of peeking in on secret IBM management committee meetings to see what goes on there is a compelling one for anyone in this industry. Like a Russian peasant glimpsing the czar in his pajamas through an open window, we are all taken with curiosity if given the chance.

Michael Killen's book purports to open the window for us and hold back the curtain. *The Making of the Common View* describes in colorful detail how IBM's many executives put together the concept and the content of Systems Application Architecture (SAA). Since SAA is intended to plug some pretty embarrassing gaps in IBM's soup-to-nuts product offerings, Killen has chosen an interesting set of meetings to look in on.

But the book may disappoint the knowledgeable voyeur. Its 22 imaginatively titled chapters detail the entire strategy behind SAA and the many problems it will solve. The information is solid and clearly explained, but a seasoned MIS veteran may not read anything he doesn't already have tucked away in some corner of his mind.

Killen skillfully weaves personalities into each chapter, giving readers a sense of the great variety of people who make up IBM's family. The book reads quickly, building toward the climactic management committee meeting at the end.

The author sprinkles in the kind of details that give you a sense of being there — the kind of details you read in a thriller like *The Day of the Jackal*: "February 17, 7:45 p.m. Carl Crawford arrived at La Guardia, walked to the baggage area and touched a button that dialed the Connecticut Limousine Service. Fifteen minutes later, a blue stretch limo whisked him north. . . ."

Killen obviously did extensive research, and it pays off in the vivid images of each chapter. But of course he couldn't actually be present at the meetings and record John Akers' words as he questioned a tentative manager in the board room. That much the author had to fill in himself, which is what will frustrate the curious among us who want to peek in and see what Akers sounds like in action.

In all, *The Making of the Common View* is recommended reading for anyone new to the field, anyone needing a solid background in the need SAA fills, or anyone who has a rainy weekend afternoon and a little curiosity.

Hardcover, $17.95, 304 pages, ISBN 0-15-143480-8, by Harcourt Brace Jovanovich, Boston, Mass.

AMY SOMMERFELD FIORE

BOOKS IN BRIEF

The Workstation Data Link
By Merv Adrian

Analysis of the manager's role in data exchange, as well as technical insight into varying methods of transferring files between PCs and mainframes.

Paperback, $24.95, 240 pages, ISBN 0-07-000474-9, by McGraw-Hill Book Co., New York.

Building a Secure Computer System
By Morrie Gasser

A detailed reference book for the day-to-day security issues often faced by computer professionals.

Hardcover, $34.95, 288 pages, ISBN 0-442-23022-2, by Van Nostrand Reinhold Co., New York.

Data Base
By Shaku Atre

The second edition of this source of techniques for designing data bases.

Hardcover, $39.95, 430 pages, ISBN 0-471-85251-1, by John Wiley & Sons, Inc., New York.

Infomap
By Cornelius Burk Jr.
and Forest Horton Jr.

Here is a map to discovering the information resources within your company; also presented are the means for pulling the resources together so that information systems plays more than just a support role in your organization.

Hardcover, $34.95, 254 pages, ISBN 0-13-464447-6, by Prentice Hall, Englewood Cliffs, N.J.

Handbook of Communications Systems Management
Edited by James Conard

Help for the MIS manager who finds himself increasingly called on to sort out his company's communications problems. Topics range from LANs, modems and SNA to bypass options, ISDN and voice-data integration.

Hardcover, $88, 992 pages, ISBN 0-7913-0091-9, by Auerbach Publishers Inc., a Warren, Gorham & Lamont Co., Boston.

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SOFT TALK

Charles Babcock

Benchmark criteria sought

The spate of relational data base management system benchmark tests during the last three months should tell us more than it does. All used the ET-1 debit/credit benchmark or a derivative of it, TP-1. Nevertheless, it is almost impossible to make any comparisons based on the results.

As noted in a May 9 *Computerworld* report, the circumstances under which the vendors conducted their tests varied widely, and in many cases the vendors slanted the results in the direction that would make their product look best. No one should be terribly surprised by this. Bigger and more reputable companies have been known to do the same thing, but customers might still hope for more meaningful results than figures that ranged from more than 100 for Relational Technology's Ingres to 13.4 for Cullinet's IDMS/SQL.

One voice of indignation raised in response to these results was Oracle Chairman Larry Ellison's, who wrote the following to his sales force: "Oracle could cheat on benchmarks, too. But wouldn't it be more interesting and fun if we could beat their bogus benchmark results without resorting to cheating?" We recommend the nearest oxygen tent for those who hold their breath on the basis of that statement. In

Continued on page 29

MUMPS spreads to more users

Specialized hospital language working for nonmedical programmers

BY ROSEMARY HAMILTON
CW STAFF

Long considered a specialized programming language for the medical community, the Massachusetts General Hospital Utility Multi-Programming System, better known as MUMPS, is breaking out of its niche.

Developed in 1966 at the Boston hospital for which it is named, MUMPS has recently shown up in such diverse situations as the source of an automated telemarketing system, the backbone of the data base management system at the National Institute on Aging and the programming environment at a sound-system manufacturer in Barrington, Ill.

In its 22 years of existence MUMPS has never had a high profile and will likely never become a widely used programming language. But its users say it will continue to enjoy quiet success.

Users say the language is easy to use, requires little programming experience, has a built-in data base facility and, as an ANSI-standard language, is portable across various hardware platforms.

One other telling sign that indicates it is far from dead was the announcement late last year by IBM that MUMPS would be available under the VM mainframe operating system.

Mad about MUMPS

"It's been branded as a medical language, so people shy away from it. But we are committed to it. We only use MUMPS," said James Wischmeyer, president of Modular Sound Systems, Inc. in Barrington.

Wischmeyer said he launched a project four years ago to automate his company's accounting department. Without any programming experience, he sought the advice of a friend who happened to be a MUMPS programmer. The friend recommended the language, and Wischmeyer took the gamble. He purchased a complete system, including the accounting applications.

The MUMPS system also came with a programmer's tool kit, which Wischmeyer put to work. He pointed out that he cannot compare MUMPS with other programming languages but that it was so easy to use that he was writing programs within a few weeks of installing the tool kit.

Users with programming experience also said MUMPS is easy to use. Rick Horwitz, president of Idleman Technology, the computer-services arm of Idleman Telemarketing, Inc. in Omaha, said MUMPS has many advantages over other procedural languages such as Cobol or Fortran. Horwitz opted for MUMPS when Idleman decided to automate its telemarketing process.

Horwitz said he likes the package MUMPS provides with its integrated data base component. While acknowledging that it is not as advanced as a true data base management system like IMS, Horwitz said the language provides a flexible environment that does not have to be defined up front.

"It lets us insert and delete textual information very quickly," he said.

DG speeds relational DBMS

BY CHARLES BABCOCK
CW STAFF

WESTBORO, Mass. — Data General Corp. said it has improved the performance of its 4-year-old relational data base management system, DG/SQL, doubling throughput to 17 transaction/sec.

The peak sustained rate was achieved while running an ET-1 debit/credit benchmark with Version 4.0 of DG/SQL on a DG Eclipse MV/20000 Model 2 with 64M bytes of memory. The average response time was less than two seconds. When the results were measured with a 95% average response time less than one second, as specified by the standards for ET-1 set by Tandem Computers, Inc. last year, the throughput rate dropped to 15 transaction/sec.

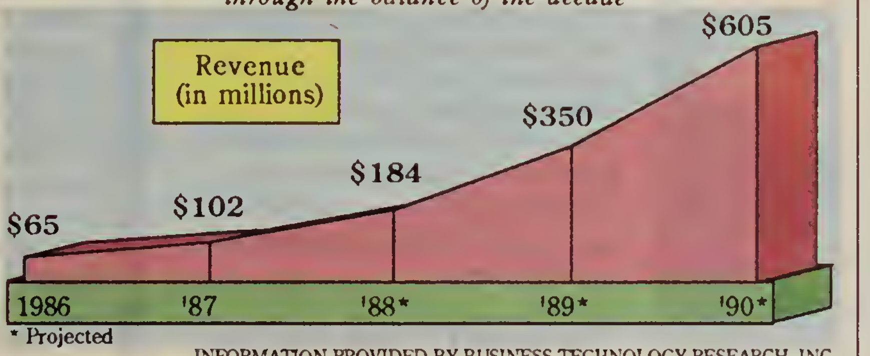
The DG benchmark met such standards as scaling, in which the number of bank branches, tellers

Continued on page 26

Data View

Big appetite for development tools

Computer-aided software engineering revenues nearly doubled between 1986 and 1987, and the trend is expected to continue through the balance of the decade



INFORMATION PROVIDED BY BUSINESS TECHNOLOGY RESEARCH, INC.
CW CHART

File transfer software eases System/36 data download

SANTA ANA, Calif. — Laguna Laboratories, Inc. recently released a file transfer system that it said enables IBM System/36 users to download data to a personal computer.

DBA/36 works with any System/36 application and reformats data into seven different PC formats, according to company spokeswoman Lyann Collins.

DBA/36 is made up of two components: a System/36 facili-

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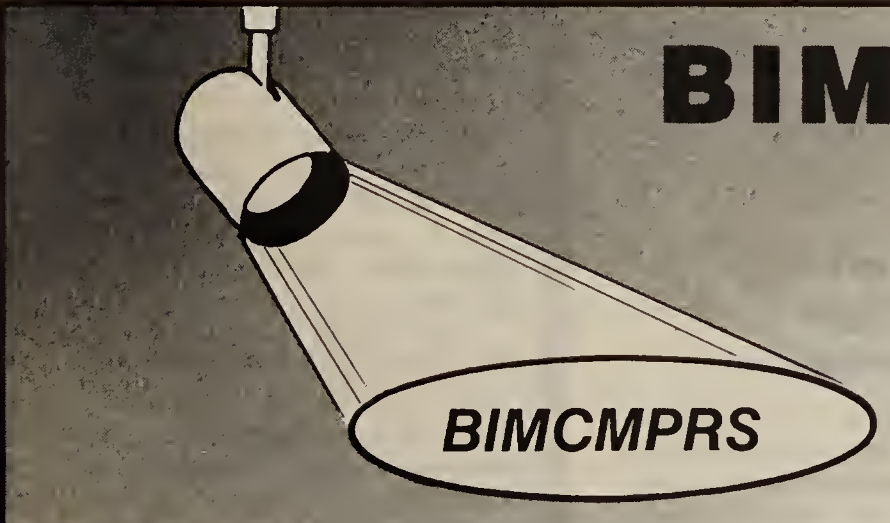
Inside

- Compushare offers All-In-1 support. Page 26.
- Vendors back 3-D graphics interface. Page 28.
- CDC adds Proact Service for DEC systems. Page 30.



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Compushare heeds users, cranks up All-In-1 support for accounting line

LUBBOCK, Texas — Compushare, Inc. recently announced that its VAS accounting software line now supports Digital Equipment Corp.'s All-In-1 office automation package.

Current users of Compushare's VAX-based software, who number approximately 600, have been requesting an interface to All-In-1, according to Stephen Sargent, Compushare's marketing director.

For Microvax users, Compushare also engineered an interface to DEC's A-to-Z Microvax-based office automation package.

With the interface, Sargent said, output from any of Compushare's VAS modules, which include all standard accounting functions, can be stored in All-In-1 file folders. The Compushare data is then treated like any All-In-1 folder, he said.

Combining files

For example, Compushare said, a user can wrap a financial statement into a word processing report or mail an aged accounts receivable report for customers in a given sales territory to that territory's sales representative.

Alternately, a user can send financial information down to an Access Technology, Inc. 20/20 spreadsheet for modeling and then forward the results to an appropriate part, Sargent said.

The All-In-1 calculator can be called from within any Compushare screen form, and any Compushare screen can be printed on the All-In-1 scratch pad.

Available immediately, the All-In-1 interface sells for $3,000. Like other Compushare products, it is covered by the company's guarantee, which ensures a response to a user call within one hour, resolution of the problem within 24 hours or double the service fee back.

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Candle adds VM reporting utility

LOS ANGELES — Candle Corp. recently began shipping its first reporting utility for the IBM VM operating system.

Epilog 1000 provides users with reports on use of direct-access storage devices, channel resources, CPUs, storage and paging.

The utility also provides historical reports that sum up system-wide use or usage broken down by individual work loads, according to Candle spokesmen.

The system reporting utility will be available for the various versions of VM, including VM/SP, VM/SP High Performance Option and VM/XA.

A trend feature can be used that allows users to spot bottlenecks and more easily plan system use, the company said.

According to Candle, the software is based on an easy-to-use command structure that requires no programming experience.

Candle sells a series of reporting and analysis utilities for other IBM environments such as MVS, CICS and IMS. Epilog 1000 is Candle's first reporting software for VM. It is priced from $2,000 to $5,000, depending on the version of the operating system, the company said.

DG speeds

CONTINUED FROM PAGE 25

and accounts matches an estimated number of transactions per second; logging two mirror images of transactions to memory devices and establishing a 90-day history file, according to DG documentation.

'More complete' attempt

Omri Serlin, president of Itom International Co., a market research and consulting firm in Los Altos, Calif., and one of the few industry figures trying to define a standard minicomputer-relational data base management system benchmark, said he has reviewed the DG results and found them to be "one of the more complete" attempts to implement an ET-1 test.

The benchmark was not independently audited, as was the Tandem benchmark and some more recent benchmarks by Sybase, Inc. and Relational Technology, Inc. The latter two tests were TP-1 benchmarks, which is a more simplified version of ET-1.

Version 4.0 of DG/SQL includes referential integrity and uses ANSI-standard SQL, as did the previous version. Version 4.0 is supported by the DG AOS/VS Transaction Processing Management System.

Gary Davis, product manager for DG/SQL, said the results of the test indicated the DG relational product was ready for transaction processing production uses, much as IBM claimed DB2 could be moved into production use as its transaction processing improved.

DG/SQL is sold as two components: a $2,900 to $17,400 development license and a $960 to $7,315 runtime license.

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You can use any version of VM/SP or VM/HPO in an SSI complex.	IBM's ISF requires that you use HPO.
You can use any processors in Group 10, 20, 30, or 40 in an SSI complex.	IBM's ISF does not support Group 10 and 20 processors. In Group 30, ISF only supports 4381's with 16 megabytes or more, and 3083's. In Group 40, ISF does not support the 3081 D16 processor.
An SSI complex supports up to 33 processors.	IBM's ISF is limited to four CPUs.
SSI dynamically switches virtual machines from one processor to another to satisfy user requirements. This means a user's terminal and virtual machine can be on different CPUs. As a result, duplicate software licensing and maintenance charges can be reduced or eliminated.	IBM's ISF offers no switching capability.
SSI balances the user load automatically.	IBM's ISF doesn't do load balancing.
You can use IUCV and VMCF to communicate between programs across processor boundaries in an SSI complex.	With IBM's ISF, you can't use IUCV and VMCF across processor boundaries.
SSI supports FBA and Count/Key/Data devices.	IBM's ISF inter-system link and spool facilities do not support FBA devices.
SSI doesn't require extended storage support.	IBM's ISF does.
SSI has been available since 1980.	IBM's ISF has been available since last year.

SSI allows multiple VM-based CPUs to communicate with each other in order to present a single system image to the users. SSI is the only current alternative to CPU upgrades that can keep user communities whole when the exhaustion of resources fragments those users onto multiple CPUs.

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Renderman standard earns support

SAN RAFAEL, Calif. — Thirteen firms have thrown their weight behind a standard for photo-realistic image synthesis for graphics workstations and supercomputers, pushing Renderman, a three-dimensional interface, as the de facto industry standard.

Renderman was developed by Pixar Co. as a language to encapsulate specification of scene information so that there is a single fixed point of contact with rendering systems, according to the company. It is a formal specification of the interface between modeling tools and software rendering systems.

Renderman has three parts: a set of geometric primitives for specifying the shape of objects; a shading language for identifying complexity in surfaces and atmospheric and lighting conditions; and mechanisms for attaching surface attributes to shapes.

The language is supported by Apollo Computer, Inc., Ardent Computer Corp., Digital Equipment Corp., Mips Computer Systems, Inc., Stellar Computer, Inc. and Sun Microsystems, Inc., among others.

No reinvented wheel

A spokesman for Ardent, which packages Renderman under its dynamic object rendering environment software, said Ardent was backing the new interface because there is no reason for it to "reinvent the wheel."

The companies backing the de facto interface standard said they will not seek the blessing of a standards committee.

Graphics computer companies "avoid standards committees like the plague," an Ardent spokesman said.

SOFTWARE NOTES

Spreadsheet now available in Spanish

Minitplan/36, a cosmopolitan spreadsheet and financial modeling package for the IBM System/36, is now available in Spanish. Developed by **Business Model Systems, Inc.** in Westmont, Ill., it will be marketed in Venezuela, Argentina and Spain. It follows versions in German, French, Finnish, Italian, Japanese, Norwegian and Swedish.

Price Waterhouse has agreed to offer consulting services to **Computer Associates International, Inc.** financial and banking customers. Price Waterhouse has installed two Computer Associates software packages, the Masterpiece series and the CA-Infopoint Banking series, at its Applied Technology Center in Tampa, Fla., where consultants will be trained.

Interactive Development Environments, Inc., a computer-aided software engineering vendor in San Francisco, recently received $4 million in venture capital, its first funding outside the company, from Thomson-CSF Ventures in Paris and Mayfield Fund in Menlo Park, Calif.

Another recipient of venture funding was **Frame Technology Corp.** in San Jose, Calif. Frame, which sells Framemaker, a document-processing package, received $3.1 million in equity financing from Menlo Ventures in Menlo Park, Calif., and Hambrecht & Quist, Inc.

Sybase, Inc. has changed the names of the Sybase system components to reflect its adherence to standards and to capitalize on the growing popularity of SQL. The Data Toolset is now called the Sybase SQL Toolset, and the Dataserver is now the Sybase SQL Server.

Digital Equipment Corp. has signed a deal with **Pentamation Enterprises, Inc.** in Bethlehem, Pa. to cooperatively market DEC-based systems to the educational market.

SQL Performance for OLTP.

Tandem challenges anyone.

Babcock

FROM PAGE 25

fact, the problem here is as much the ambiguities surrounding ET-1 as it is cheating.

ET-1 first achieved its status as a budding benchmark when a group of industry figures took a Bank of America request for proposals for an on-line transaction processing system and attempted to translate it into a set of criteria for measuring transaction processing systems. The criteria were described in an April 1985 *Datamation* article by Anon et al.; Jim Gray of Tandem was part of the group.

Tandem further defined the criteria and used them in its ET-1 benchmark of VLX Nonstop SQL in March 1987, and that test has served as the model on which the others have patterned themselves.

Well, almost. TP-1 is a derivative of ET-1 that is less expensive to set up and less costly to run. It concentrates on the data base manager's performance, while Tandem's ET-1 concentrated on the total price/performance of a hardware and software system. TP-1 also fires transactions at the data base manager.

Omri Serlin, president of Itom International in Los Altos, Calif., has attempted to label a full ET-1 as a Class I debit/credit benchmark and TP-1 as a Class II debit/credit benchmark. He offers criteria governing both. He is preparing a report on how well the benchmarks have complied with one or the other.

In using these criteria, Serlin looked at a competitive-analysis document issued by Unify in January 1987 that compared results of Unify with those of Informix and Oracle. The results listed Unify as capable of 12 transaction/sec. compared with four for Informix and two for Oracle.

But Serlin noted that the test had used only 100,000 account records when it should have used one million, and it did not specify which processors, disk drives or operating system were used in the test.

"Despite the inclusion of complete listings from all three cases, there are several other ambiguities and contradictions in the Unify document. The validity of the results is therefore in grave doubt," he warned.

If Serlin and other fair-minded observers can minimize the ambiguities in a Class II TP-1 benchmark, we may yet have a way to compare Oracle, Ingres, Sybase, Unify and the other relational DBMS products.

Babcock is *Computerworld's* senior editor, software & services.

System/36

FROM PAGE 25

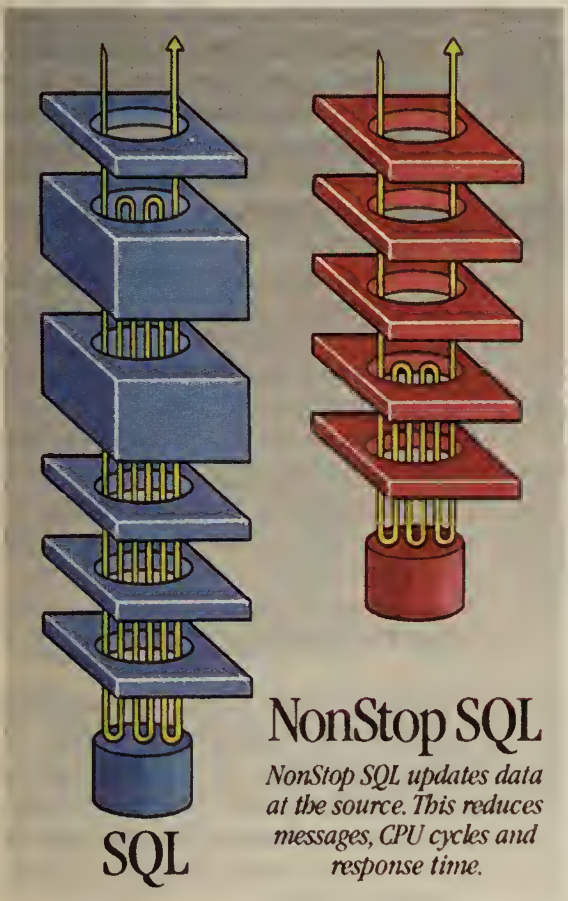
ty and a PC program. The System/36 component sends files to the PC component, which reformats the file in the PC format selected by the user, Collins said.

Common formats

The seven PC format choices include formats for commonly used programs such as Lotus Development Corp.'s 1-2-3, Ashton-Tate Corp.'s Dbase and standard Cobol files.

Collins said the software is menu-driven, thus enabling users to walk through the process of downloading files.

The DBA/36 package, which is currently available, is licensed for the System/36 only. Unlimited PCs may be used with DBA/36. Licenses range in price from $478 to $1,195, depending on the processor model.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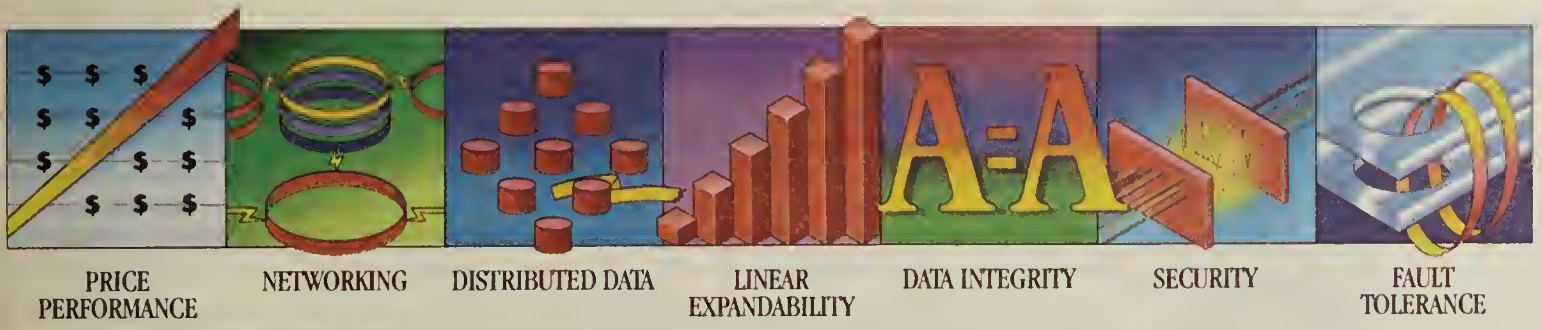

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NEW PRODUCTS

Systems software

Graphic Software Systems, Inc. will ship a free upgrade of its **Direct Graphics Interface Standard** (DGIS) firmware to graphics board companies that have licensed DGIS for their TMS34010-based graphics boards.

The vendor claimed the firmware allows Microsoft Corp. Windows 2.0 and other software to run at substantially higher speeds than were previously possible.

DGIS is the board-level software interface between a graphics processor and numerous application packages. These applications include software based on Windows 2.0, Autodesk, Inc.'s Autocad ADI and the IBM Graphics Development Toolkit.

Graphic Software Systems, P.O. Box 4900, Beaverton, Ore. 97005. 503-641-2200.

Applications packages

Trajectory Software, Inc. has announced **Lex PDQ**, a word processing and data base system for Unix, Xenix, DOS, and other operating system environments. The product is an upgrade of the Lex word processing and data base system.

The system incorporates a 130,000-word spelling dictionary, a mass-mailing system and macro capabilities. Enhancements include support for multiple fonts, expanded Help screens, horizontal scrolling and keyboard function keys.

Lex PDQ costs from $495 to $10,000, depending on operating environment.

Trajectory Software, 555 Goffle Road, Ridgewood, N.J. 07450. 201-447-5200.

CRI, Inc. has upgraded its project management software for Hewlett-Packard Co. computers.

Projectalert 2.0 will run on the HP 900 series Spectrum systems and retain the original support offered for HP 3000 series minicomputers.

The release has been repackaged to include color graphics, project management reports, micro-scheduling and optional precedence notation or activity-on-arrow scheduling.

Projectalert 2.0 costs $7,500 to $37,500 depending on hardware options selected.

CRI, P.O. Box 58004, Santa Clara, Calif. 95052. 408-980-9898.

Utilities

A conversion tool for translating Datapoint Corp. RPG-II batch source code to Databus source code has been introduced by **Diversified Data Services, Inc.**

Called **Go-Between**, the software tool allows compilation and execution of RPG-II programs in Microsoft Corp. MS-DOS, Digital Equipment Corp. RMS or Unix environments, according to the company.

The program also removes the shared-file restriction of RPG-II, thereby providing access to programs that would previously have been locked out during RPG-II application transactions.

Go-Between costs from $4,200 to $6,000.

Diversified Data Services, 1035 Branch Ave., Providence, R.I. 02904. 401-421-8500.

Services

Control Data Corp. has expanded its service offerings with the addition of system performance and monitoring tools for Digital Equipment Corp. systems. The company's **Proact Service** consists of two components, **Proact 1000** and **Proact 2000.**

Both components reportedly offer programmable thresholds, which allow system managers to select parameters for system operation, and an interface to Dectalk.

In addition, software supplied under Proact 1000 includes continuous system monitoring, Decnet monitoring and a security system. Software under Proact 2000 allows users to conduct VMS performance and monitoring functions and includes comparative analysis reporting.

Prices for the Proact 1000 and Proact 2000 Services vary between 5% and 15% of the basic monthly maintenance charge.

CDC, 1101 E. 78th St., Bloomington, Minn. 55420. 800-345-9903.

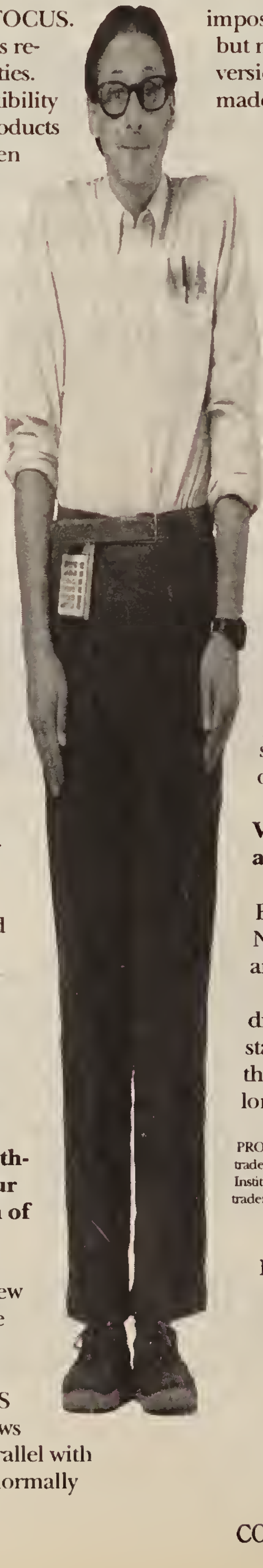
Development tools

A graphical modeling system that reportedly offers unrestricted binding capabilities has been announced by **Sherrill-Lubinski. SL-GMS** allows developers to create screens, displays or custom graphical interfaces and offers more than 80,000 lines of source code.

The product is hierarchical and written in straight C code. Transparent interfaces to standard Pascal and Fortran are available in the SL-GMS library. SL-GMS runs on all versions of Unix, as well as in the Digital Equipment Corp. VMS environment. It works with windowing systems from Sun Microsystems, Inc., DEC and Silicon Graphics, Inc.

SL-GMS costs $9,500 to $12,500, with application or runtime configurations starting at $2,400.

Sherrill-Lubinski, Suite 255, Hunt Plaza, 240 Tamal Vista Blvd., Corte Madera, Calif. 94925. 415-927-1724.



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AUTOFIT

3

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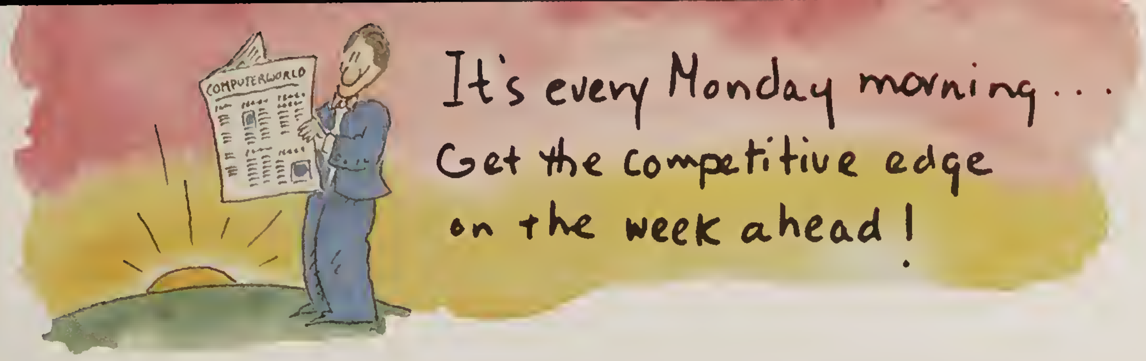

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   - 38. Data Comm. Network/Systems Mgt

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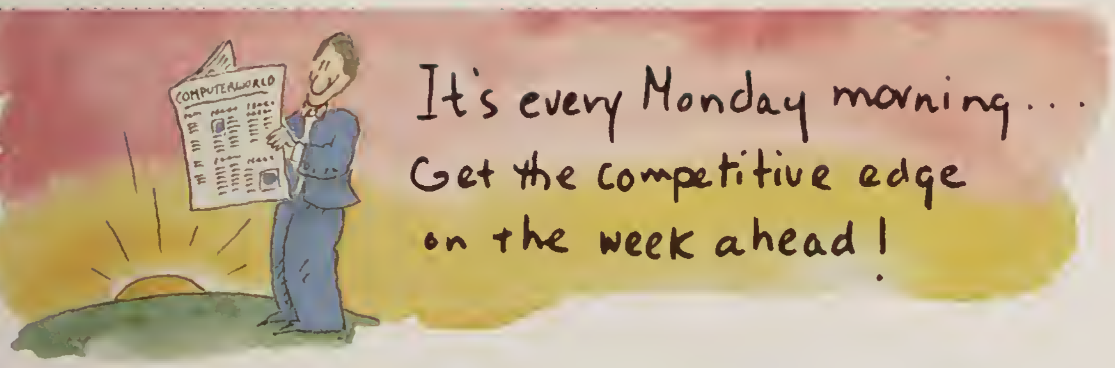

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MICROCOMPUTING

MICRO BITS

Douglas Barney

Stop pulling punches

Only the weak pick fights? In hockey, it is not often that a wimp picks a fight with a bully. Given the nature of the sport, the wimp would be pulverized every time. Of course, the tough guys love to fight because they usually win.

But in some marketing texts, picking a fight with your rival is a sign of weakness. This precept has kept Lotus from lashing out at competitors that have slammed it at every turn. And it is a precept that Lotus President Jim Manzi has vowed to uphold.

In light of recent developments, it may be time for Lotus to rethink that approach and fight fire with fire. Sometimes when you turn the other cheek you get kicked in the behind. And there are some within the company who happen to agree.

So far both Borland and Microsoft have been giving Lotus a few swift boots, and the company has merely grumbled. Under their breath (and not for attribution), the Lotus folks are steamed at Borland's performance claims, which they say are wrong. But Lotus won't re-

Continued on page 47

Filemaker strings up the Mac

BY JULIE PITTA
CW STAFF

FOSTER CITY, Calif. — Nashoba Systems, Inc. has introduced a new version of its data manager for Apple Computer, Inc.'s Macintosh, adding multiuser capabilities via local-area network support.

Called Filemaker 4, the product is an enhancement of Filemaker Plus, a single-user data manager for the Mac. According to Infocorp, a Cupertino, Calif., market research firm, 50,000 copies of Filemaker Plus and its predecessor, Filemaker, also for the Mac, have been shipped since those products debuted.

Bill Higgs, a software industry analyst at Infocorp, said that adding multiuser capabilities to Filemaker was a "marketing checkpoint" for Nashoba. "Companies that are installing Macintoshes are increasingly using them in networks," Higgs said. "End users are asking if a package has multiuser capabilities. It may not be terribly important to selling the product today, but it will be in the future."

Infocorp classifies Filemaker 4 and earlier versions as flat filers rather than as true data base managers. Higgs said the distinction lies in the relational abilities of a data base manager. "The data is not stored in a matrix or table," he explained.

The leading product in the flat-filer category is Microsoft Corp.'s File, although Filemaker Plus is currently selling more briskly than that product, according to Infocorp.

Nashoba's new version attempts to bridge the gap between entry-level flat filers such as File and more complex data base managers such as Fourth Dimension, a package for the Macintosh from Acius, Inc., Higgs said.

Filemaker 4 can run on Macintosh networks with or without a dedicated file server. It adds standard multiuser features such as record locking and password protection. Other upgrades include enhanced graphics for creating forms and reports.

The price of Filemaker 4 is $299.99. A four-user pack, including four sets of software, manuals and support materials, is priced at $599.99.

An upgrade kit for Filemaker Plus is priced at $50 for a single-user version and $200 for the four-user pack.

Keeping tabs on where the bears roam

BY ALAN J. RYAN
CW STAFF

INUVIK, Northwest Territories — In the wilderness of Canada's Northwest Territories, wildlife biologists have stopped physically chasing after paw prints and hoofprints. Instead, they use the less fatiguing method of satellite collars, personal computers and phone lines to track the home ranges of various animals.

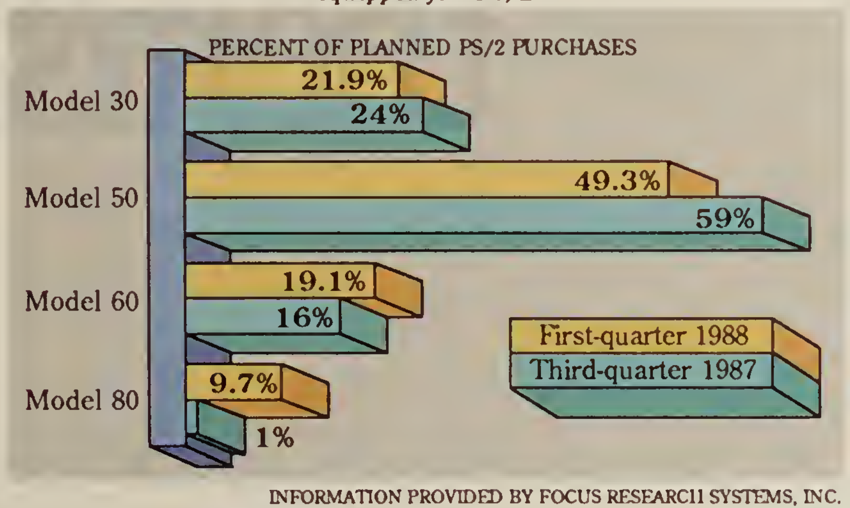
By closely tracking the animals, the biologists find out exactly where polar bears and other animal populations reside within the Canadian arctic.

Continued on page 46

Data View

Mainframe sites step up high-end PS/2 plans

Users are turning to faster IBM Personal System/2s that are better equipped for OS/2



INFORMATION PROVIDED BY FOCUS RESEARCH SYSTEMS, INC.
CW CHART

UK Peat Marwick moves toward Excel standardizing

BY PAUL SAUNDERS
IDG NEWS SERVICE

LONDON — The world's largest accounting firm, Peat Marwick McLintock, will standardize on Microsoft Corp.'s Excel spreadsheet and phase out Lotus Development Corp.'s 1-2-3 and Supercalc. The move follows a decision in April by the auditing group of the second largest accounting firm, Arthur Andersen & Co., to ditch 1-2-3 worldwide in favor of Microsoft's offering.

Peat Marwick McLintock, which has approximately 500 Compaq Computer Corp. Deskpro 286 machines and AST Research, Inc. personal comput-

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Inside

- Reviews of Total Word, Quick C, Pageperfect. Page 35.
- A rewritten Manuscript. Page 45.
- Let your computer do the dialing. Page 46.

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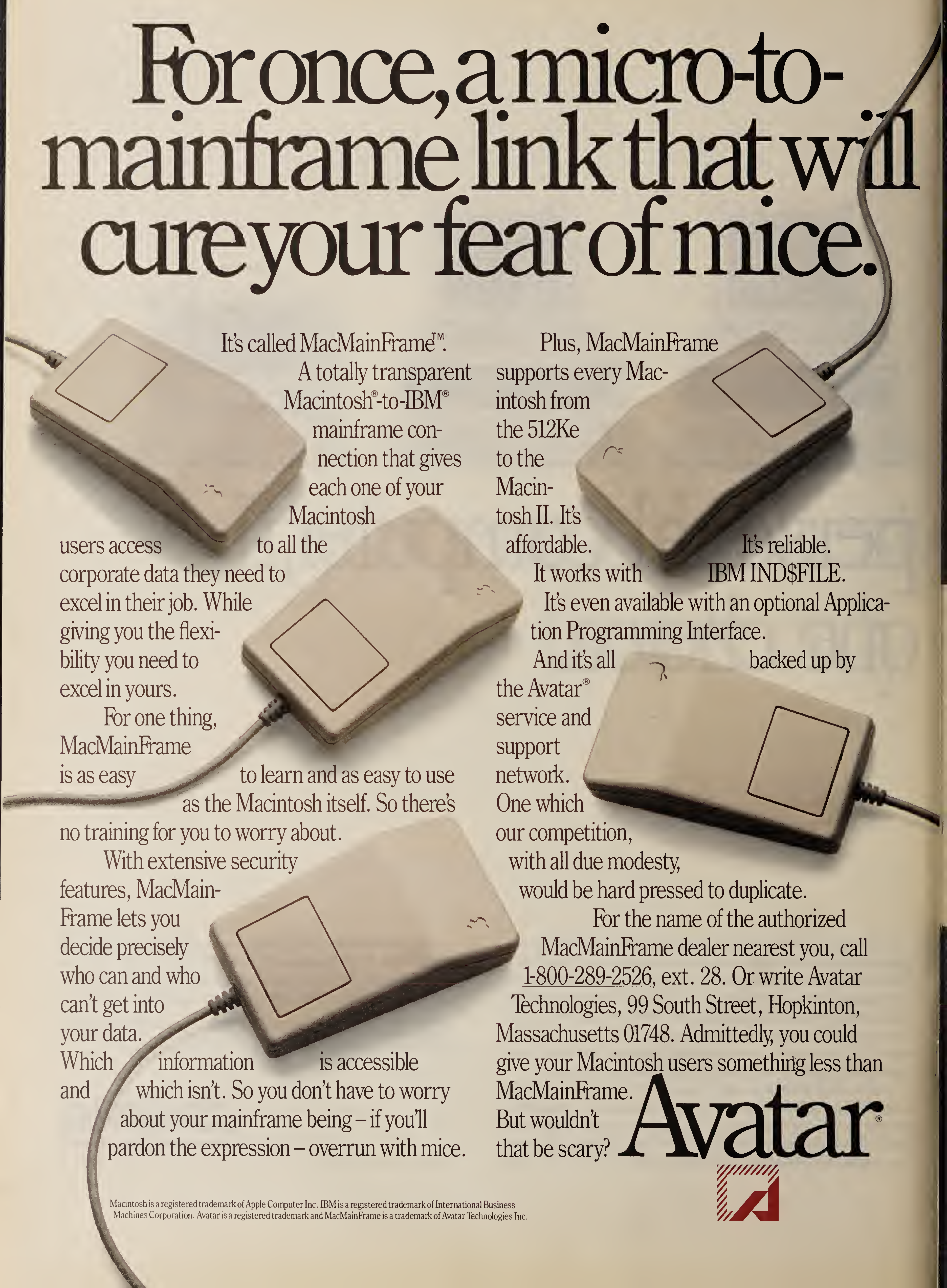

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REVIEWS/NEW PRODUCTS

The last word on Lifetree's Total Word

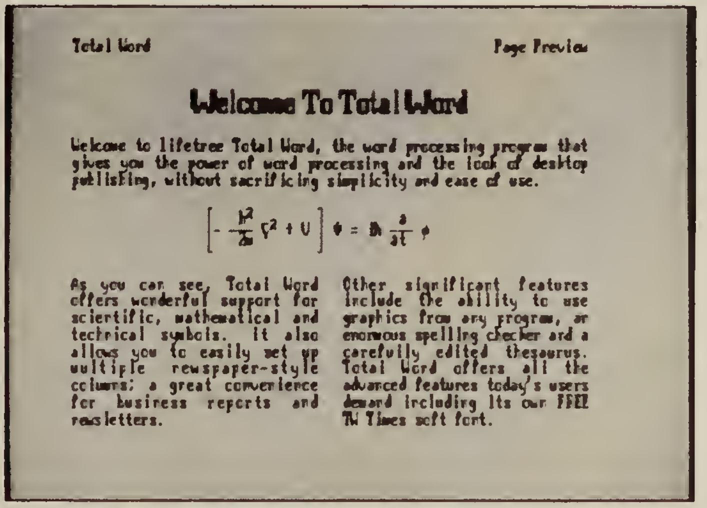
Total Word, the latest Volkswriter incarnation from Lifetree Software, Inc., employs the traditional Volkswriter user interface and maintains a dedication to ease of use. It offers a reasonable alternative to more elaborate professional programs such as Micropro International Corp.'s Wordstar 2000 Plus Release 3 or Microsoft Corp.'s Word 4.

Features: Total Word offers most of what we have come to expect in the most powerful office/professional word processing programs. It includes all regular editing commands for cursor moves, cut and paste and similar functions.

It also permits the inclusion of nonprinting comments for tracking revisions and editing changes. Directory management has been improved. Footnotes or end notes can be included, and there is a formula-processing system that uses alternate keyboards. The keyboards also provide access to foreign language and special character sets.

Other features include indexing, table of contents, redline/strikeout, macros, forms management, mail merge and a screen-capture graphics import facility.

Total Word's handling of page layout, style sheets and laser printer fonts is based on the use of style sheets containing the specifications for appearance characteristics. It permits the use of up to 250 layouts or sets of appearance specifications in a single document. A Times Roman soft font that can be used immediately with Hewlett-Packard Co. Laserjet-compatible printers is included. File transfer utilities are primitive; Total Word accepts only Volkswriter and straight ASCII files.



Total Word

Page Preview

Welcome To Total Word

Welcome to Lifetree Total Word, the word processing program that gives you the power of word processing and the look of desktop publishing, without sacrificing simplicity and ease of use.

$$\left[-\frac{\hbar^2}{2m}\nabla^2 + V\right]\psi = i\hbar\frac{\partial}{\partial t}\psi$$

As you can see, Total Word offers wonderful support for scientific, mathematical and technical symbols. It also allows you to easily set up multiple newspaper-style columns; a great convenience for business reports and newsletters.

Other significant features include the ability to use graphics from any program, an enormous spelling checker and a carefully edited thesaurus. Total Word offers all the advanced features today's users demand including its own FREE TW Times soft font.

Total Word *welcomes the user aboard.*

Total Word

Price:$495

- Performance: Poor
- Documentation: Very good
- Ease of learning: Very good
- Ease of use: Very good
- Error handling: Satisfactory
- Support: Unacceptable
- Value: Good

Performance: Poor. Total Word's editing capabilities make full use of special graphics cards and color. Unfortunately, the product performs slower than average office and professional word processors. Its Undo command helps recover from accidental deletions but does not recover block deletions.

Total Word's math function is easy to use, but the simple line-sorting function permits only one sort field and requires sort fields to be arranged in columns. Also, the graphics screen-grabbing program captured most screen images we tried, but we could not find any way to remove Snapshot from memory. Total Word lacks support for uneven columns, paragraph or outline numbering and cannot handle both footnotes and end notes in the same document. However, there are some pluses: The spelling checker and thesaurus perform well, and on-line automatic hyphenation is effective.

Documentation: Very good. Total Word has good, clear documentation, including a printer manual and a quick-reference guide. We discovered some inconsistencies between what the manual describes as being on the screen and what actually appears, but the special printer manual does a reasonable job of explaining how to use features of the laser printers.

Ease of learning: Very good. Total Word is one of the easiest high-power word processors to learn to use. Its ready-made style sheets and installed soft fonts get a novice up and running in a reasonable amount of time.

Ease of use: Very good. As Total Word users gain experience, the function keys and other facilities make it possible to work quickly and effectively.

Error handling: Satisfactory. Total Word crashed several times when performing rather routine functions such as deleting a printer driver. But, despite numerous annoying bugs, we lost no data, and error messages were clear and acceptable.

Support: Unacceptable. The company offers an unlimited — but not toll-free — customer support line from 8 a.m. to 3 p.m. Pacific time. We called the technical support number provided on the documentation 10 times and received nothing but busy signals. Support policies include bug fixes of Total Word, notice of all improvements and upgrades and a free subscription to the company's newsletter, "Newsline." There is also a 60-day money-back guarantee.

Value: Good. Somewhat less powerful and less flexible than the best of the high-power word processing programs, Total Word nonetheless excels in ease of learning. With features sufficient for all but the most demanding office requirements or sophisticated document preparation, we believe this program is especially suitable for users who need an easy-to-learn and useful word processor with strong laser printer support and effective soft-font control.

Note

Reviews are provided by the IDG News Service.

Users win Quick C, Turbo C face-off

Once again, Borland International and Microsoft Corp. meet head-on in the war of the languages — and once again the users benefit. Microsoft's Quick C, while ideal for novices, also offers a complete, integrated programming environment for professional programmers.

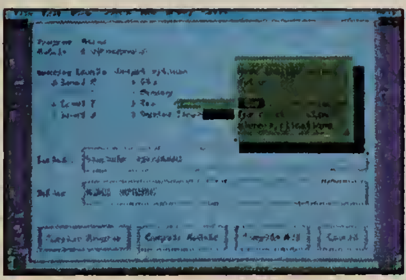
Features: Quick C implements the full ANSI C standard and provides access to extensions you can turn on or off at will. It uses the full Microsoft C Version 5.0 function libraries and compiles any program that 5.0 compiles except those that use the huge memory model. It is even compatible with Xenix C.

Quick C provides not only an editor but also a compiler, a debugger, a program list manager and libraries. Moreover, Quick C's built-in Help function is like having a set of quick-reference cards at your fingertips.

Quick C also provides for constant folding and automatic generation of Intel Corp. 80286 instructions. Finally, programs written using Quick C can be compiled unchanged under Version 5.0.

Quick C is not an interpreter, but its compile times are really fast — Microsoft says 10,000 lines per minute. The built-in source-level debugger is a subset of Codeview; you can use Codeview to debug the programs. In the editor, you can trace program execution, set watch points and variables, view output and set breakpoints.

The libraries and linker provided with Quick C are capable and flexible. You can tailor libraries to your space needs and link object modules created under Quick C to object modules from other programming languages. Quick C also includes a comprehensive library of graphics functions.



Quick C

Price:$99

- Performance: Good
- Documentation: Excellent
- Ease of learning: Very good
- Ease of use: Very good
- Error handling: Good
- Support: Excellent
- Value: Excellent

The editor includes automatic matching of braces, brackets and parentheses and has full search-and-replace capabilities. It does not provide syntax checking and capitalization of key words as you type. Quick C is compatible with Microsoft's Windows/386.

Performance: Good. Compiling inside the Quick C environment was fast under all conditions, and we had no trouble modifying files intended for use with the Version 5.0 C compiler. We ran into a few minor problems; we solved most of the screen problems under Windows/386 by installing the Vega Video 7, Inc. IBM Video Graphics Array device driver, but then the cursor in the Quick C programming screen sometimes disappeared. That did not happen under Windows/386, only under DOS on our 386 system. Microsoft's support staff sug-

Continued on page 45

IMSI's desktop Pageperfect not quite up to perfection

Although International Microcomputer Software, Inc.'s (IMSI) Pageperfect sports many promising features, its attempt to provide integrated desktop publishing falls short of the ideal to which it aspires.

Features: Pageperfect consists of a file management shell and a word processor that has page composition features. It is bundled with IMSI's $195 graphics package, Desktop Publisher's Graphics.

The file management shell allows for DOS operations, such as selecting and creating directories and subdirectories, as well as file functions, such as copying, renaming or deleting files. The word processor functions in two modes: text and layout. The text mode includes several standard word processing features, such as an 87,000-word dictionary, a limited thesaurus and search-and-replace and text copy-move functions. There are also partial emulations of the Multimate International Corp. Multimate and Micropro International Corp. Wordstar command sets.

Page Perfect

Price:$495

- Performance: Satisfactory
- Documentation: Very good
- Ease of learning: Satisfactory
- Ease of use: Satisfactory
- Error handling: Good
- Support: Very good
- Value: Satisfactory

In the layout mode, you can create and size picture blocks, then place into them pictures from the Picture Librarian. You can vary the width and line weight of borders for the blocks, select and size margins and gutters and change the texture and gray-level intensity of any block. You can also create captions.

Pageperfect includes 12 style sheets, each of which contains page size, page layout and caption styles for business documents. Additional style sheets and a design guide are available.

The Picture Librarian allows

Continued on page 38

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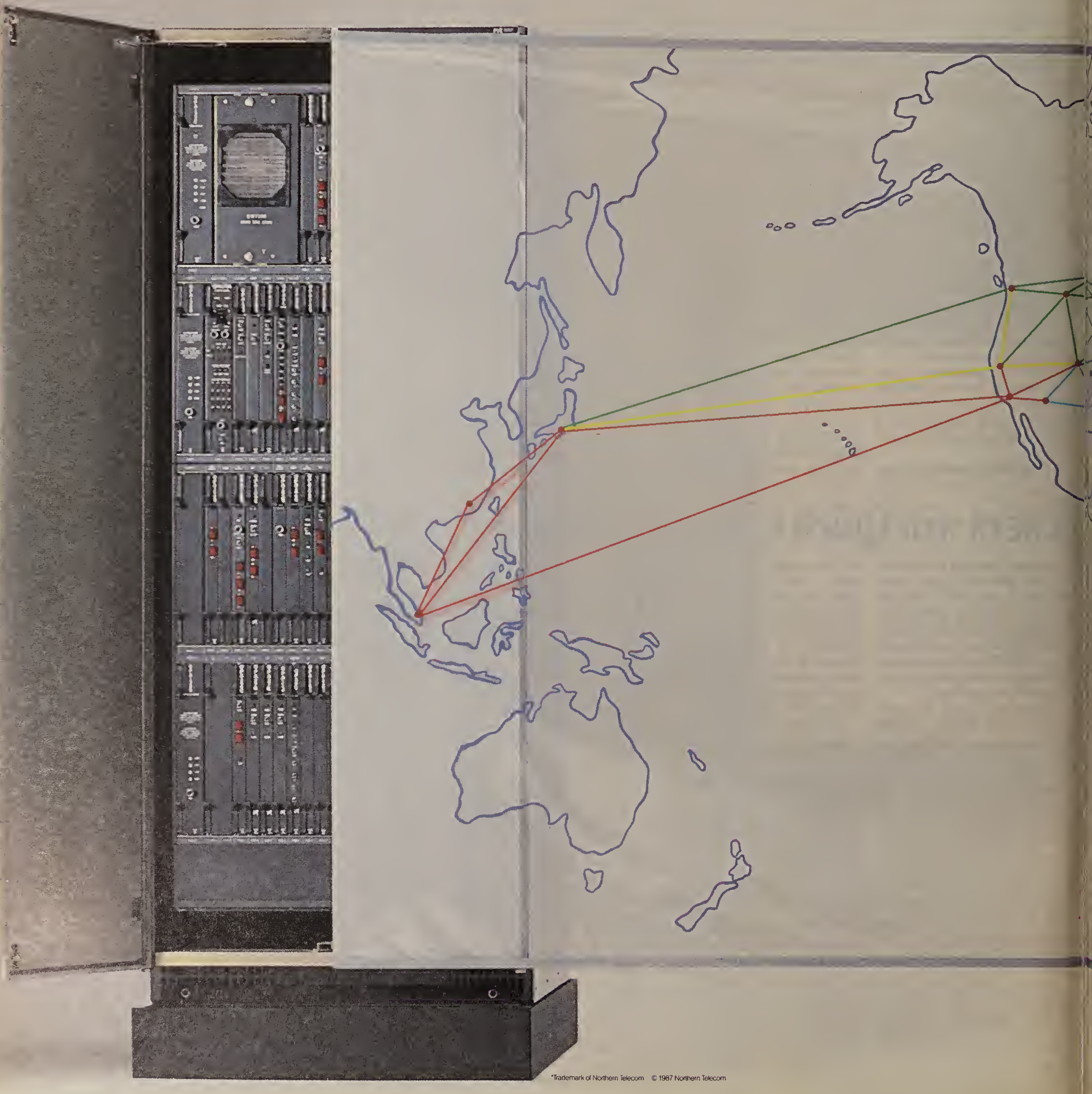

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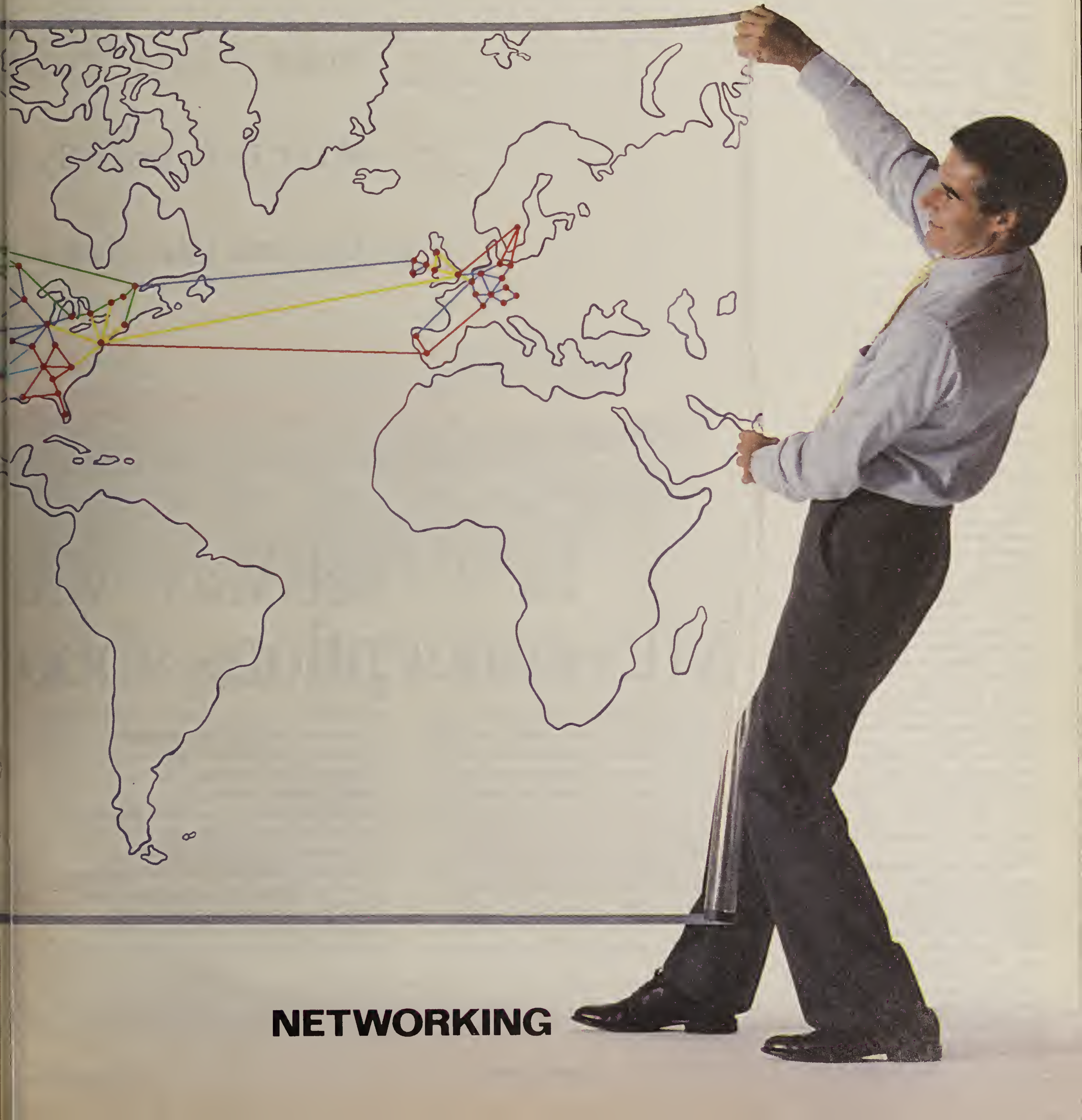


NETWORKING

Pageperfect

FROM PAGE 35

you to create and store pictures. Also, if you are using the Desktop Publisher's Graphics program, you can change pictures stored in a file.

Performance: Satisfactory. Pageperfect works. Its word processor is reasonably robust, its layout features are suitable for the demands of everyday desktop publishing and its graphics program is useful. But with use, what stands out are the product's irritations. For instance, since the Multimate emulation is neither complete nor exact, it is very confusing to use. And although Pageperfect supports both a keyboard and a mouse, its mouse handling will drive any experienced mouse user mad.

Pageperfect's word processing performance is slow, and although it touts a full what-you-see-is-what-you-get screen display, the resolution at a 150% zoom level was less than satisfactory. To its credit, Pageperfect comes with nine levels of zoom for viewing the page on the screen.

We ran into one serious reproducible bug. We created a drawing using Desktop Publisher's Graphics and saved it in Pageperfect's Picture Librarian. Pageperfect performs a conversion function on the picture before storing it in the Picture Librarian.

On the IBM Personal Computer AT, this conversion process scrambled the picture image enough to make it unreadable. IMSI claims to have fixed this problem in current shipments of Pageperfect.

Documentation: Very Good. The tutorials in both the Pageperfect package and the accompanying Desktop Publisher's Graphics package are exemplary. The reference guide is also quite good. Most subjects were clearly explained, although the index suffered from omissions of key topics such as tabs and function keys.

Ease of Learning: Satisfactory. It took several hours to reach a moderate comfort level with the product, a process complicated by the variations and inconsistencies in the way functions are selected and by the constant need to refer to the manual. The tutorial is a saving grace, as are the abundant Help screens.

Ease of use: Satisfactory. Pageperfect lacks intuitive operation. The function key-driven style limits flexibility and forces you to remember commands or look for them in the manual. The poor implementation of the mouse, limitations in the word processing emulations and other quirks are a further hindrance. The file management shell, on the other hand, is wonderfully simple to understand; it helps keep you oriented and organized.

Error handling: Good. When you are using Pageperfect, error conditions are brought to your attention by a combination of audible tones and displayed messages, which are short but to the point. The Undo feature works well in most instances, and Help screens are abundant and clearly explain some error-related information. Additionally, each time you save a document, Pageperfect automatically backs up the previous version.

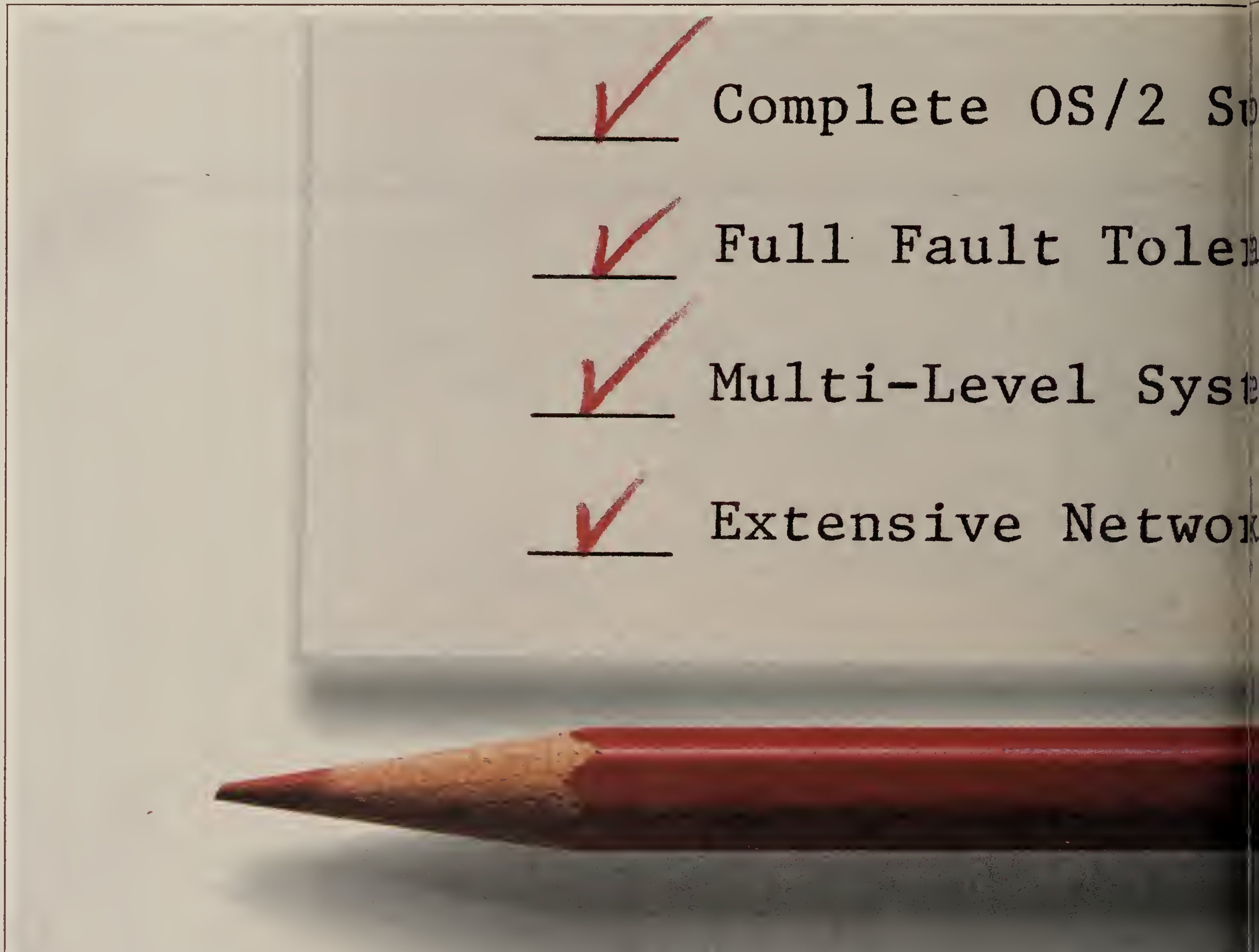
Support: Very good. Pageperfect comes with a 30-day money-back guarantee. IMSI offers free telephone support for a 45-day period starting with your first call, which must come within six months of purchasing Pageperfect.

An extended support plan is available for $95.

The IMSI technical support staff is top-notch. Both knowledgeable and courteous, it exhaustively researched problems and kept us informed. We never had to wait more than five minutes for a return call.

Value: Satisfactory. Pageperfect, while not perfect, does integrate basic word processing and graphics-layout capabilities in one turnkey system at a fair price.

However, problems with performance and ease of use mean that the serious word processor user or desktop publisher will still have to look to nonintegrated desktop publishing solutions for now.



SFT NetWare® v2.1

MIS-conceptions about

Traditionally, the MIS world has viewed PC-based local area networks with a healthy dose of skepticism. A "prove it to me" attitude. And in an arena ruled by powerful mainframes, that approach has given rise to a few misconceptions and doubts about LAN performance.

Well, doubt no more. Because with the industry standard SFT NetWare v2.1, Novell offers the LAN software powerful enough to convince even the toughest MIS skeptic.

SFT NetWare v2.1 gives you the features and functionality of mini/mainframe systems at a fraction of the cost. With extensive fault tolerance, security and LAN-to-mainframe connectivity, it makes LANs advanced enough for major corporate, government and education installations.

No other LAN software even approaches the level of fault protection and data security built into SFT NetWare v2.1. Novell has pioneered LAN fault tolerance, and provides protection from failures in server hardware. In addition, enhanced security locks and passwords give you complete control of the information stored on your LAN.

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NEW PRODUCTS

Systems

An eight-port supermicrocomputer, based on AT&T Unix System V, Release 3, has been announced by **Cubix Corp.**

According to the vendor, the multiuser system is positioned to compete directly against the Compaq Computer Corp. Deskpro 386 and the IBM Personal System/2 Model 80.

Dubbed the **QB2 386**, the product includes 2M bytes of random-access memory, which is expandable to 8M bytes, and employs surface-mount technology. Also included with the multiuser system is an 80M-byte Winchester drive, a 60M-byte tape drive, a 5¼-in. floppy disk drive and an uninterruptible power supply, according to the vendor.

The QB2 386 has a price tag of $8,995.

Cubix, 2800 Lockheed Way, Carson City, Nev. 89706. 702-883-7611.

Cordata Technologies, Inc. has announced an IBM-compatible personal computer that reportedly runs both IBM and Apple Computer, Inc. software.

Called the **Cordata WPC Bridge**, the system was designed with a built-in 12-in. monochrome monitor and comes with 512K bytes of random-access memory, which can be expanded to 768K bytes. Also included are two 360K-byte 5¼-in. disk drives, three expansion slots and an Apple nine-pin Game Port for joysticks.

Support is offered for IBM-compatible 3½-in. drives, external Apple drives and IBM Color Graphics Adapter monitors. An IBM Personal Computer AT-style board comes standard with the system.

The Cordata WPC Bridge costs $1,695.

Cordata Technologies, 1055 W. Victoria St., Compton, Calif. 90220. 213-603-2901.

Software applications packages

Micropro International Corp. has announced **Wordstar Professional Release 5**, an updated version of its original Wordstar word processing program for the IBM Personal Computer, PC XT, AT and compatibles.

Enhancements include newspaper-style column creation, telecommunication functions, outlining and mail list management. Other additions include windows for simultaneous editing of two documents and a speller and thesaurus with definitions.

Wordstar Professional Release 5 costs $495. Upgrades are available for $119.

Micropro International, 33 San Pable Ave., San Rafael, Calif. 94903. 415-499-1200.

A memory manager package that reportedly provides complete control of all memory-resident programs has been introduced by **Delta Technology International.**

Extra allows users to create their own menus and will access any other memory-resident program. The package can run up to 26 memory-resident programs while using the random-access memory of only one.

System requirements include the following: an IBM Personal Computer, PC XT, PC AT, Personal System/2 or compatible with 256K bytes of RAM. A hard disk is also required.

The program runs on Microsoft Corp. MS- or IBM PC-DOS 2.0 or higher.

Extra costs $99.

Delta Technology, 1621 Westgate Road, Eau Claire, Wis. 54703. 800-242-6368.

An electronic mail system for the Apple Computer, Inc. Macintosh computer has been announced by **CE Software.**

The product provides real-time conferencing among two or more people and has both audio- and visual-timed repeat-message notification.

Quickmail can automatically generate a transcript of conferences, which can be saved as text or copied to a clipboard. A

Continued on page 42

pport

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LAN performance.

SFT NetWare v2.1 simplifies network management with menu-driven utilities that let you control the network from any workstation. Advanced accounting features allow you to audit and account for users or departments utilizing network resources. Available communications links give you unsurpassed connectivity with mini/mainframe systems and other LANs. And SFT NetWare v2.1 supports OS/2 as well as DOS workstations.

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For more information, call from your modem 1-800-444-4472 (8 bit, no parity, 1 stop bit) and enter the access code NV217.

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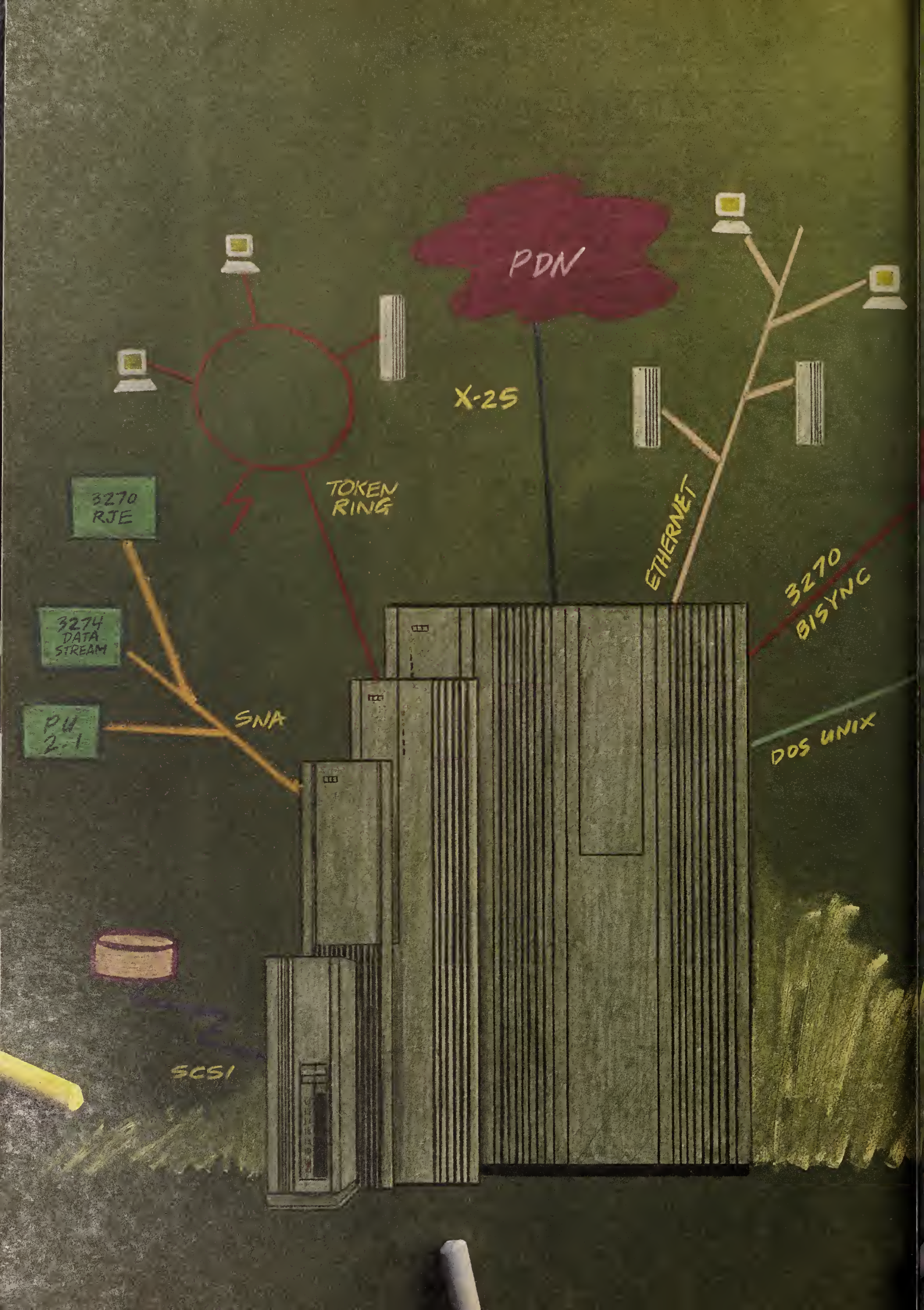
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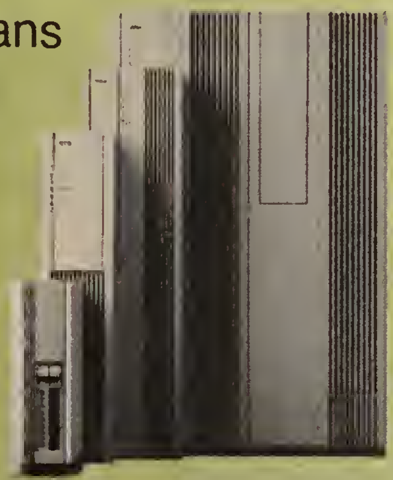

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Continued from page 39

public bulletin board is also included. The package works with fonts, boxes, icons and other graphic elements.

Quickmail costs $300 per 10 users.

CE Software, 1854 Fuller Road, West Des Moines, Iowa 50265. 515-224-1995.

Security software for IBM Personal Computers, Personal System/2s and compatibles is now offered by **Foundationware**. The six-module package, called **Vaccine**, detects variations in software caused by power surges, brownouts and static electricity.

The product ensures that programs meet original factory specifications, and it catches hard disk drive and controller failures before any data is harmed. Vaccine protects a system from intentional and unintentional erasure of data and software and requires a hard disk and 384K bytes of system memory.

Suggested list price for Vaccine is $189.

Foundationware, 2135 Renrock Road, Cleveland, Ohio 44118. 216-932-7717.

Lattice, Inc. has released **Secret Disk II**, a data security and encryption package for Microsoft Corp. MS-DOS systems.

Menu-driven software creates hidden system files on floppy or hard disks, on which the data and programs are then automatically encrypted. Protection can be turned on or off at any time without rebooting the system.

Password-protected access to files is provided through an MS-DOS device driver, and encryption algorithms can vary at different levels.

Secret Disk II costs $79.

Lattice, 2500 S. Highland Ave., Lombard, Ill. 60148. 312-916-1600.

Software utilities

Softcraft, Inc., manufacturer of fonts and font utilities for desktop publishing software and word processors, has released a bit-map font package for personal computer users with either Aldus Corp.'s Pagemaker, Xerox Corp.'s Ventura Publisher or Microsoft Corp.'s Windows.

The **Font Solution Pack** can reportedly create fonts, symbols, characters and logos and install them with matching screen fonts for a what-you-see-is-what-you-get display.

Users can create logos that measure up to 2 2/3 by 2 in. and generate typefoundry-quality fonts in sizes ranging from 3 to 120 points.

The Font Solution Pack costs $595.

Softcraft, Suite 500, 16 N. Carroll St., Madison, Wis. 53703. 608-257-3300.

A macro processor for Apple Computer, Inc. Macintosh computers is currently being shipped by **Affinity Microsystems Ltd.**

Tempo II Version 1.0 allows Macintosh users to quickly create automatic routines in order to speed repetitive tasks, according to the vendor.

The created macros may be used by typing the macro's name, or a portion of it, in a pop-up dialogue box.

Macros may also be made universal to come into play in any application, and a single macro may involve any number of applications.

The system requires a minimum 1M byte of memory.

Affinity Microsystems, Suite 425, 1050 Walnut St., Boulder, Colo. 80302. 800-367-6771.

Development tools

A programming environment designed to work with IBM and Microsoft Corp.'s OS/2 has been announced by **Logitech, Inc.**

The software tools in **Modula-OS/2** operate in dual-mode, which reportedly aids in porting applications between Microsoft MS-DOS and OS/2. The product also allows application development under protected mode, real mode or both. The software is built around the Logitech Modula-2 compiler and includes a real-mode and a dual-mode version of the standard V 3.0 library.

Modula-OS/2 costs $349.

Logitech, 6505 Kaiser Drive, Fremont, Calif. 94555. 415-795-8500.

Ultrasync.
You're looking at the new star in display technology.
Actual unretouched screen image.

Software enhancements

System Network Architects, Inc. has revised its utilities package for users of Xerox Corp.'s Ventura Publisher. **VPtoolbox 2.0** is a stand-alone program that includes utilities for managing and documenting Ventura files and style sheets.

File management functions enable the user to view and manipulate files, including printouts of text, line art and image files. The package will run on systems that support Ventura Publisher.

VPtoolbox will be distributed through Xerox Ventura Publisher dealers and will cost $99.

System Network Architects, P.O. Box 3662, Princeton, N.J. 08543. 609-683-1237.

Data storage

A series of erasable optical disk drives has recently been announced by **Maxtor Corp.**

The 5¼-in. **Tahiti I** reportedly provides one formatted gigabyte of total storage and a seek time of 30 msec. The drive can also accept a 600M-byte removable ANSI-standard cartridge. Sector size may be set at 1K or 512K bytes, with 25K bit/in. and 16.9K track/in.

Volume OEM pricing on the Tahiti I will be approximately $2,500 per unit.

The **Fiji I** is a 160M-byte 3½-in. drive that is said to have an average access time of 100 msec. Designed to provide low-cost storage, the product can be used as a floppy drive replacement and for backup applications. The drive will cost less than $1,000 on volume purchases.

Both drives use removable media and include a small computer systems interface.

Maxtor, 211 River Oaks Pkwy., San Jose, Calif. 95134. 408-432-1700.

Micropolis Corp. has announced a line of hard-disk kits that reportedly provide integration capabilities of up to 337M bytes of storage for the IBM Personal System/2 Models 60 and 80 and the IBM Personal Computer XT, PC AT and compatible systems.

The **Performance Advantage Kits (PAK)** include 5¼-in. hard disk drives with formatted memory storage capacities ranging from 44M to 337M bytes. The kits also provide all cables and mounting hardware, DOS partitioning software and software drives for Novell, Inc. Netware 2.0 and 2.1 and The Santa Cruz Operation, Inc. SCO Xenix 2.2.

The PAKs cost $920 and up, depending on the microcomputer and memory configuration used.

Micropolis, 21211 Nordhoff St., Chatsworth, Calif. 91311. 818-709-3300.

Printers/Plotters/Peripherals

A color Adobe Systems, Inc. Postscript printer developed for graphics design and electronic publishing applications has been introduced by **QMS, Inc.**

The **Colorscript 100** includes a proprietary external controller with RS-232, Apple Computer, Inc. RS-422/Appletalk and Centronics Data Computer Corp. parallel interfacing. A 300 by 300 dot/in. Mitsubishi Electronics America, Inc. G650 color thermal transfer print engine is also standard.

The product generates seven primary colors, and users can print from black, three-color or four-color thermal ink films. The Colorscript 100 costs $24,995.

QMS, One Magnum Pass, Mobile, Ala. 36618. 205-633-4300.

Grafpoint, Inc. has added Tektronix, Inc. software emulation products for the Macintosh II. **Tgraf-07** emulates the Tektronix 4107 terminal and supports the Apple Computer, Inc. Macintosh color graphics board.

The software permits up to 16 colors with a display resolution of 640 by 480 pixels. **Tgraf-15LR,** Tektronix 4115 emulation software, has the same resolution but can display up to 256 colors simultaneously.

Tgraf-07 costs $995, and Tgraf-15LR costs $1495.

Grafpoint, 1485 Saratoga Ave., San Jose, Calif. 95129. 408-446-1919.

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Ultrasync, with its exceptionally fine (.28mm) dot pitch, creates a picture of incomparable clarity. Capable of displaying infinite shades of brilliant color with striking contrast and dimension.

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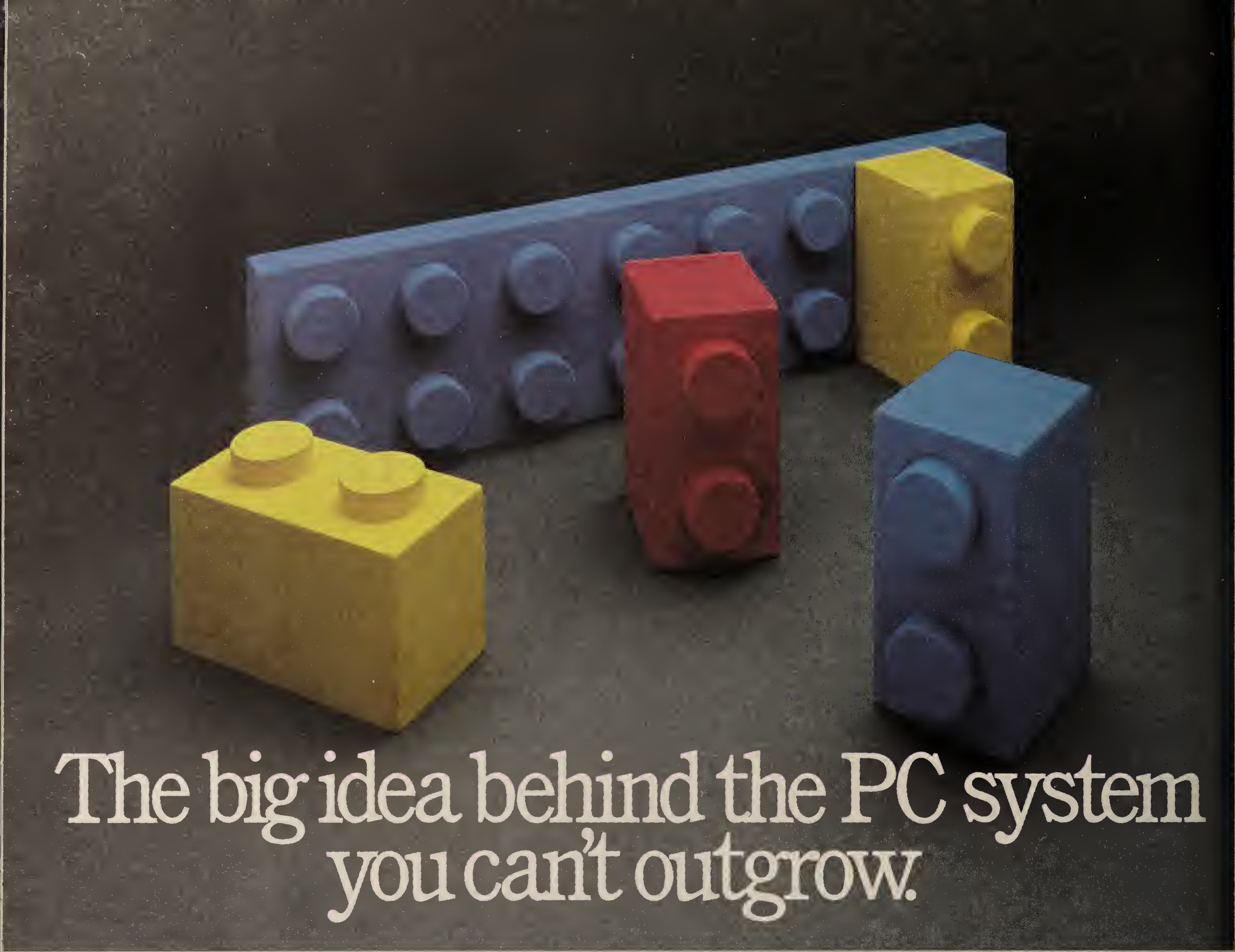

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Rewritten Lotus Manuscript targets complex documents

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. has written a new Manuscript — word processing software, that is.

Lotus introduced Manuscript, written by 1-2-3 co-author Jon Sachs, in 1986 and positioned the product as a technical word processor. The firm encountered relatively sluggish sales for the $495 feature-rich product and is now aiming at the larger market of users who generate complex documents.

Target uses include legal and government documents, financial reports, product specifications and documentation and proposals.

The product is already packed with a bevy of features for combining text and graphics; Lotus has kicked in a few more. Manuscript 2.0 now includes a facility for the dynamic linking of spreadsheet data to Manuscript documents and keyboard macros, which helped push the firm's 1-2-3 to the top of the spreadsheet heap.

Manuscript also comes equipped with a 220,000-word thesaurus, on-screen Help and menu-driven markers to assist users in plugging graphics, data or equations into documents.

To boost the output side, Bitstream, Inc. last week announced the availability of the Fontware Installation Kit for Manuscript 2.0. With this kit, users can reportedly download as many as 40 different fonts that are available in virtually any point size.

Quick C

CONTINUED FROM PAGE 35

gested we use Quick C with a "plain vanilla" system.

Also, our evaluation copy came with 5¼-in. disks, and the installation program made us go through some gymnastics to load Quick C onto 3½-in. disks.

Documentation: Excellent. For both novices and experienced programmers, Quick C's documentation is a marvel of comprehensiveness and clarity. The language reference manual provides complete documentation of the Standard C language and Microsoft's optional extensions.

Ease of learning: Very good. Novices who want to use this package to learn programming in C should already have a nodding acquaintance with general programming concepts.

The integrated Help function is focused on the language itself, and although you do not actually need a mouse to use the system, Microsoft's mouse eases using and learning Quick C.

Ease of use: Very good. Quick C is powerful, versatile and consistent enough to provide immediately useful tools for the most proficient C programmers. The options for customizing Quick C are simple and work well. The number of options and the need to decide what types of programs you will be writing make installation somewhat of a challenge. But once it is in place and customized, the integrated environment provides one of the easiest ways we have seen to develop programs in C.

Error handling: Good. The error messages displayed in the pop-up window at the bottom of the Quick C screen are usually informative enough that you need not refer to the manual. The manuals contain appendixes with additional documentation on error messages.

Support: Excellent. Microsoft's technical support staff is responsive, helpful and knowledgeable. It is available by phone from 8 a.m. until 5 p.m. weekdays through a menu system that gets you to the right person very quickly.

Value: Excellent. In both price and features, Quick C is directly comparable to Borland International's Turbo C. The increased productivity possible through Quick C provides a substantial return on the $99 investment.

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IBM gave dynamic allocation to CICS...but you need Netec's CAFC to make non-stop CICS a reality. CAFC allows a single command to OPEN or CLOSE 5 or 50 files. CAFC establishes two way communication between your CICS regions and your batch jobs. Your batch jobs will always have the files they need for processing without operator intervention.

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Moose

FROM PAGE 31

"There are little pockets of bears that stay in the same general area. We want to get a better idea of those areas so we can manage those populations as best we can scientifically," said Gordon Stenhouse, a wildlife biologist with the Government of the Northwest Territories' Department of Renewable Resources.

The biologists tag bears, moose, caribou and Dall's sheep with special collars called platform terminal transmitters that emit radio waves. The transmitters, originally designed to mark buoys in shipping lanes, send up signals to a polar-orbiting satellite, which passes the information to a receiving station in Toulouse, France.

From France, the information is sent to a ground receiving station in Alaska and one in Washington, D.C. "We dial up the computer in France, key in our password and entry parameters, and it tells us where the animals are located in latitude and longitude and gives us an idea of the temperature of the air around the animal," Stenhouse said.

He noted that it is difficult to keep tabs on many polar bears even with automated methods because of the physical makeup of the adult males. These bears have cone-shaped heads and are unable to wear the collars. Fortunately, biologists are able to put collars on the adult females.

The collars are powerful enough to emit waves even when the bear is in a den several feet below the snow or ice. The ability to locate bear dens also allows biologists to protect those areas.

Using computer tracking, the biologists are able to more concisely create zones in which the bear and other populations can be found, Stenhouse said.

The tracking takes place on IBM compatibles, mostly Hewlett-Packard Co. Vectra systems. The biologists are using Cary, N.C.-based SAS Institute, Inc.'s SAS software to crunch the data and manage the data base and SAS Graph to graph the movements. "Sometimes we get five locations for the same animal in one day. The computer can handle that," he said.

At the end of the hunting season, the government group sends out letters to inform the hunters on how their kill related to the average for the season. By monitoring the harvesting, the biologists can be sure that quotas for animals taken from any zone are not being abused.

On-line yellow pages let keys do the walking

Disk-based system holds toll-free, local numbers

BY ALAN J. RYAN
CW STAFF

NORCROSS, Ga. — If Digital Publications, Inc. has its way, users will let their fingers do the walking on the keyboard and their computers do the dialing. And most of the calls will not cost a thing.

The small company has introduced the PC Yellow Pages, a data base of 10,000 businesses with toll-free telephone numbers. The data base also lists 5,000 local business numbers for each area code in the U.S.

The disk-based product for Microsoft Corp. MS-DOS-based personal computers is not an electronic version of the Nynex Yellow Pages, cautioned John M. Rapp, the company's marketing director.

Instead, Rapp said, it incorporates Digital Publications' own main data base of 5,000 entries in categories like hotels, insurance companies, conglomerates and banks. Additionally, Digital Publications has arrangements with other information providers to include various other company names and numbers, according to Rapp.

The program features pop-up windowing, color and graphics and keeps all category indexes in memory, Rapp said. It features automatic telephone dialing from Hayes Microcomputer Products, Inc. and compatible modems to either individual businesses or to all listings in a given category. Because of the dialing feature, the program could be used as a telemarketing tool, Rapp noted.

> BUSINESS travelers can make hotel arrangements in distant cities without having to call directory assistance for hotel listings.

The company said it sees little use for PC Yellow Pages in the home market, Rapp said, adding that it is targeted mainly at businesses. For example, he said, business travelers can make hotel arrangements without having to call directory assistance for hotel listings.

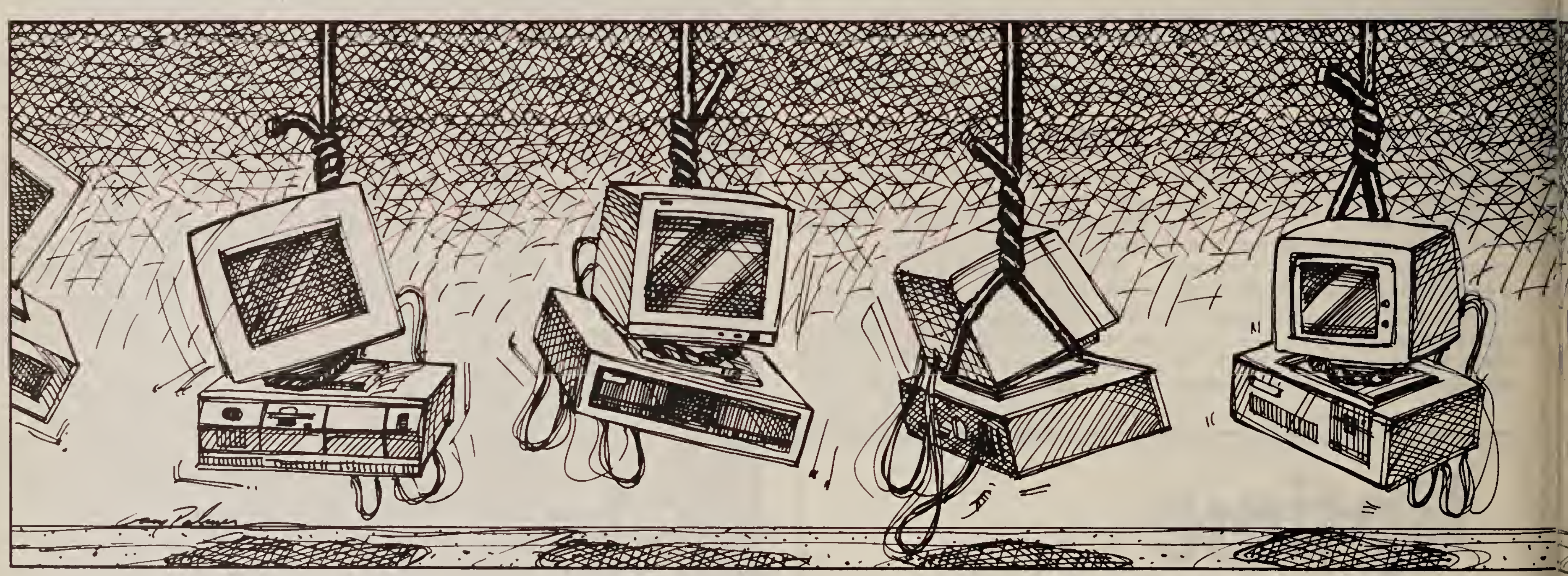
Easier than dialing

To access the data base, the user selects either the local or the 800-number listing. An alphabetical topic index will appear, allowing the user to search for a selected topic. Once in the topic, the file can be paged through or searched for a particular name or city.

Furthermore, the program produces mailing labels and Rolodex-type cards and can export data to the customer's word processing program and to data management programs.

The package, which can be stored in less than 1M byte on a hard disk, costs $99.99 for listings under one area code plus the 10,000 800-number listings.

Also included is a catalog of more than 50 vertical market Information Paks under categories like architectural firms or computer magazine publishers. The Information Paks will sell for $39.



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Through a single, flexible communication interface, Arbiter creates a centrally administered and controlled environment where the fast, powerful PC is treated as a peer, not a slave. Tasks are allocated according to the strengths of the host and PC by a link that uses little host overhead while achieving transfer rates unmatched by TSO, CICS and CMS-based links.

Through virtual disks or direct access to the host's files, Arbiter delivers fast, responsive PC/host data transfer as required, either by the megabyte-sized file or by the exact subsetted transaction.

Arbiter empowers PC users with peer-to-peer communication between their PC and APPC (LU 6.2) environments like CICS, S/3x, and token-ring LANs.

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Barney

FROM PAGE 31

lease its own benchmarks.

And the company is more than a bit ticked at Microsoft, which is offering a money-back guarantee. Meanwhile, Lotus quietly scoffs at Excel, which requires top-of-the-line PC equipment and fails to translate a great many Lotus macros.

But still it refuses to get pulled into the muck. At the same time, though, some customers view Lotus's nonresponse as an admission that its competitors' claims are true.

If some Lotus folks have their way, the firm will take the gloves off pronto and start to slug. But if Manzi, who calls the shots, holds firm, the best we journalists can expect is the usual off-the-record bad-mouthing of competitors.

DOS to deliver? IBM has apparently been polishing PC-DOS 3.4, which it can then license back to Microsoft for sales to IBM competitors.

PC-DOS 3.4 adds expanded-memory capabilities and includes easy-to-use features, eliminating many of the cryptic commands that PC-DOS currently relies on to manipulate files. So instead of the nonaesthetic "A>," users will be greeted with fancy (for DOS, that is) pull-down menus.

The operating system seems ready to go, according to one user with a beta-test version. Based on the documentation that comes with the new PC-DOS, IBM is planning to ship memory boards that take advantage of the expanded-memory support. The source was uncertain when IBM would announce the new operating system. With OS/2 still languishing from a lack of breakthrough applications, the need to extend PC-DOS has become critical. Hopefully, PC-DOS 3.4 will be the ticket.

Lappers. During a recent trip to IBM, we asked what users were looking for in the way of new hardware. Besides things like a desktop 386 and faster Model 50s with palatable hard drives (things IBM had just happened to announce), users are asking for portable computers, an IBM executive said.

When asked whether these would be equipped with the Micro Channel architecture, he hinted that users want to be able to run OS/2 on the things. Although IBM has been pushing the Micro Channel as optimized for OS/2, we'll let you jump to your own conclusions.

Still waiting for them coprocessors. Some have postulated that IBM will move toward realization of the Micro Channel by announcing a variety of coprocessor boards. IBM officials and reliable sources have tossed around the idea of communications and data base coprocessors aimed at enhancing IBM's OS/2 Extended Edition.

But others see more and confidently predict both Series/1 and System/36 coprocessor boards to ship later this year. There may be a couple of uses for these. One is to develop host applications on less expensive micros, a popular pastime in many an MIS shop. Also, small work groups that can't afford the real thing could use a Personal System/2 to run applications used by the rest of the firm.

Thanks for the memory sales. Some managers are getting ready for Lotus's 1-2-3 Release 3.0 by advising individual end users to stock up on memory. The way the theory goes is that, despite Lotus's best efforts, it will never again duplicate the 400K bytes of worksheet space available under Release 2.01. In fact, none of its key competitors have either.

So if users want to run the same large models, they had best get more memory. And for the hardy souls who will run it under OS/2, best get 2M to 3M bytes.

We'd hate to bug you. Recent reports of bugs in Borland's Quattro have scared off a few customers who haven't evaluated the program for themselves. We've heard a couple of different stories. Some say it is too buggy to buy. Others, including a large software reseller, say the problems are no worse than any other piece of software.

So we decided to go to the horse's mouth and ended up with two slightly different answers. Borland founder Philippe Kahn said the rumors are hogwash. "There is no problem. Those bugs were fixed," he said.

But Borland spokeswoman Robin Shephard offered a slightly different version. "We already addressed those bugs [that were reported] with either work-arounds or a commitment that they are already fixed and will be available in the next version." Hmmm. So some fixes are still on the way?

Barney is a *Computerworld* senior editor, microcomputing.

Peat

FROM PAGE 31

ers, has recently bought a similar number of Apple Computer, Inc. Macintosh SEs with 20M-byte hard disks. It has equipped each Mac with a copy of Excel and is slowly phasing in the PCs at a total software cost of $475,000.

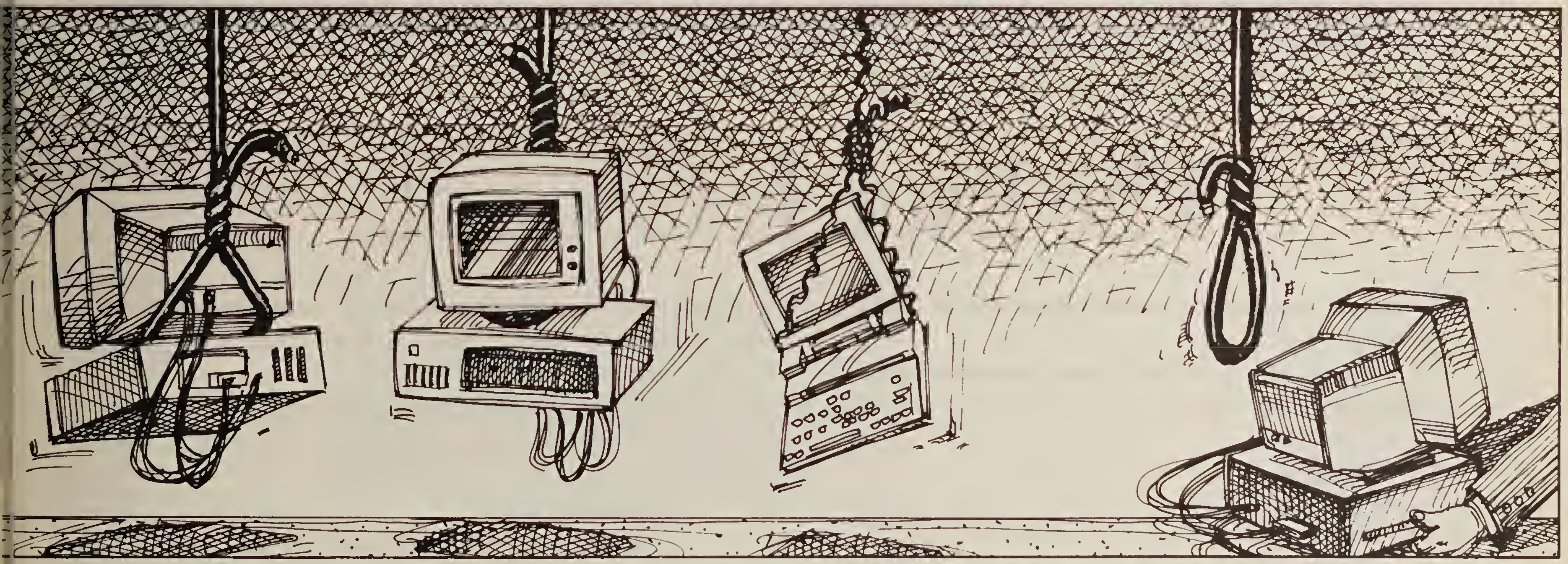
Geoff Russell-Grant, a Peat Marwick partner responsible for office automation, said Excel was chosen because it is offered under both DOS and the Macintosh operating system and allows standardization on one package.

Seeking strategy

"We want to have strategic products. Excel is from a reputable company, it's one of the latest spreadsheets and it runs in both environments," Russell-Grant said.

Simon Rogers, UK marketing director of Lotus, said the company would be concerned if firms were going over to Excel completely but that he found it was often just departments changing spreadsheets.

"The latest figures we've got show that Excel has managed to achieve 6% of the spreadsheet market. Lotus sales have continued to grow since May last year," he said.



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NETWORKING

DATA STREAM

Thomas White

Connectivity at Apple's core

Last of a two-part series looking at Apple's connectivity strategy

The protocol of the future, the ISO's Open Systems Interconnect (OSI), has attracted a great deal of interest from both the commercial and government communities.

Rather than develop its own products, Apple Computer, Inc. has chosen to make a strategic investment in OSI vendor Touch Communications, which offers products that support the lower levels of the OSI model. This allows the interested user to begin to use the functionality of OSI while resting assured that upgrading to a fuller set of OSI capabilities will be reasonably painless.

With the popularization of Transmission Control Protocol/Internet Protocol (TCP/IP), it has become a strategically important internetworking environment. In fact, the number of vendors offering TCP/IP products has increased by 100% in the last year. Research firm Infonetics estimates that this will be a $959 million market by 1991.

Although Apple has not officially announced plans to support TCP/IP, it is well known that the vendor has contracted with Ungermann-Bass to provide this support. If the method that Apple has used to support IBM's Advanced Program-to-

Continued on page 64

Users, vendors pin high hopes on fiber standard

BY KATHY CHIN LEONG
CW STAFF

American Express Co. is waiting. So is Stanford University and Eastman Kodak Co. Even companies not currently using the technology say they can only benefit by keeping an eye on its development.

Everyone is talking about Fiber Distributed Data Interface, or FDDI. "It will cause you to rethink the way you do business," said Douglas Taylor, a network manager at Hughes Aircraft Co. in Long Beach, Calif.

This yet-to-be-approved fiber interface standard is bringing vendors such as IBM, Digital Equipment Corp., Sun Microsystems, Inc. and Apollo Computer, Inc. under one roof to hammer out a universal standard for device connectivity.

When the FDDI standard is complete — which some say will happen by the end of this year — users may well be pounding at the door for products. While many of today's network managers are using Ethernet protocols over fiber, these same people are anxious to see FDDI products available because they promise to provide faster speed and transparent interoperability among different vendors' machines.

The good news is that FDDI is expected to bring both higher network speeds and cost savings, since users ideally will be able to keep their existing investments.

FDDI is an emerging local-area network standard that is moving quickly beyond the draft stage and will be adopted by the American National Standards Institute when completed. FDDI calls for 100M bit/sec. bandwidth and supports a token-passing protocol in a ring topology. It allows users to link up to 500 workstations along a 100km length of fiber. When completed, FDDI will allow users to link high-end hardware to other

Continued on page 62

3Com execs talk merger

Carrico, Estrin: Brief tenure not a sign of trouble

In a surprise announcement May 26, 3Com Corp. President and Chief Operating Officer William Carrico and Bridge Communications, Inc. Division General Manager Judith Estrin both said they would resign, effective June 30, to pursue a new, as-yet-unspecified venture.

Carrico and Estrin

Caught off guard, a number of industry analysts expressed concern about a resulting loss of momentum or "brain drain" from Bridge and also questioned the impact of the merger on 3Com and Bridge sales efforts.

Dismissing some of those fears, Carrico and Estrin talked last week with *Computerworld* Senior Editor Patricia Keefe. The former Bridge executives also talked about how mergers are actually much harder than they look.

Why are you both leaving 3Com after only eight months?

Estrin: We made a personal decision based on what we want to do. If 3Com wasn't in good shape we wouldn't feel comfortable [about leaving]. We have a lot of time, energy and stock invested in the company. There's been a lot of progress in integrating 3Com and Bridge, and that, coupled with the beginning of the fiscal year [June 1], creates a good time for transition.

Carrico: Judy captured the essence. The company is in good shape; business is good, our prospects are good, products are rolling out and we're on track fiscally. That, plus our desire to go out and do something new, made it happen.

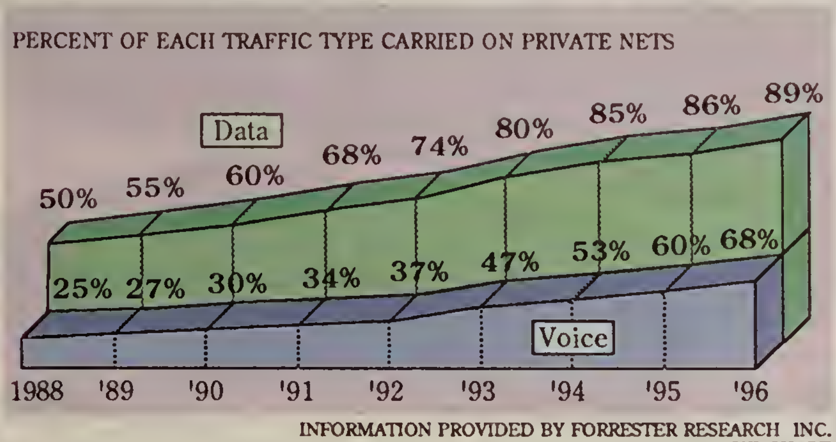
How much of a factor was the difference in manage-

Continued on page 57

Data View

Traffic picks up on private nets

Although both voice and data transmissions are projected to increase, voice should grow faster while data levels off



INFORMATION PROVIDED BY FORRESTER RESEARCH INC.
CW CHART

Apollo joins net parade

BY PATRICIA KEEFE
CW STAFF

CHELMSFORD, Mass. — Apollo Computer, Inc. last week strengthened its entry into the nascent vendor-sponsored network design and consulting services market by announcing two related service programs.

The Network Services Program reportedly assists Apollo Domain token-ring and IEEE 802.3 Ethernet customers with network planning, design, installation and management.

The Professional Services Program targets users of Apollo's Domain System workstation-based network environment with software consulting, applications design and systems

Continued on page 56

Inside

- Domino's uses pizza network to get larger slice of market pie. Page 52.
- Network General adds Laptop Sniffer. Page 62.
- Kinetics gives AUX support to Etherport II. Page 67.

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	Model 70 386			Model 50 Z	
Available models	8570-E61	8570-121	8570-A21	8550-031	8550-061
Microprocessor	80386 16 MHz 0-2 wait-states	80386 20 MHz 0-2 wait-stetes	80386 25 MHz 64KB memory ceche (30ns)	80286 10 MHz 0 wait-stetes	
Optional Math Co-Processor	80387 16 MHz	80387 20 MHz	80387 25 MHz	80287 10 MHz	
Memory (RAM)					
Standerd	1Mb (100ns)	2Mb (85ns)	2Mb (80ns)	1Mb (85ns)	
Maximum on system board	6Mb	6Mb	8Mb	2Mb	
System maximum	16Mb	16Mb	16Mb	16Mb	
System expansion	Three option slots (two 32 bit, one 16 bit)			Three option slots	
Storage					
1.44Mb 3.5 inch diskette drives					
Standard	1	1	1	1	
Maximum	2	2	2	2	
Fixed disk					
Standard Mb	60 (27ms)	120 (23ms)	120 (23ms)	30 (39ms) 8550-031	60 (27ms) 8550-061
Operating Systems	DOS 3.30, IBM OS/2, AIX™ Personel System/2			DOS 3.30, IBM OS/2	
Built-in features	Video Graphics Arrey (VGA) and display port, diskette controller, serial, parellel, keyboard end pointing device ports, clock/calendar				

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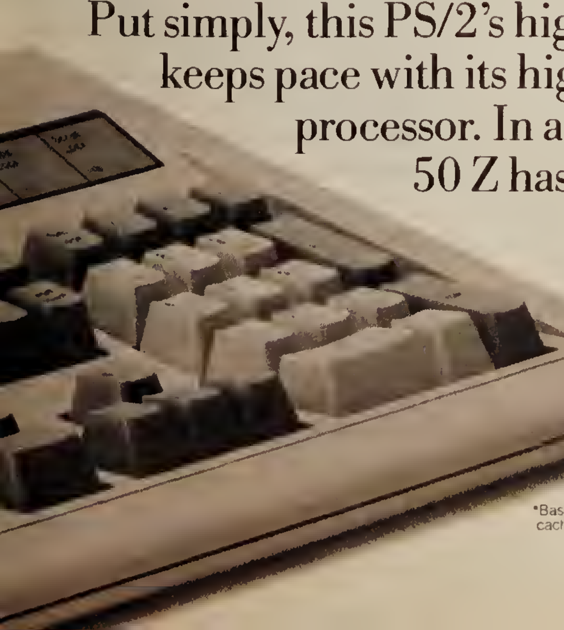
The "Z" stands for zero-wait-state computing. Put simply, this PS/2's high-speed memory keeps pace with its high-performance processor. In addition, the Model 50 Z has new larger capacity fixed disks with faster access to data. The result is a performance improvement of up to 35%.*



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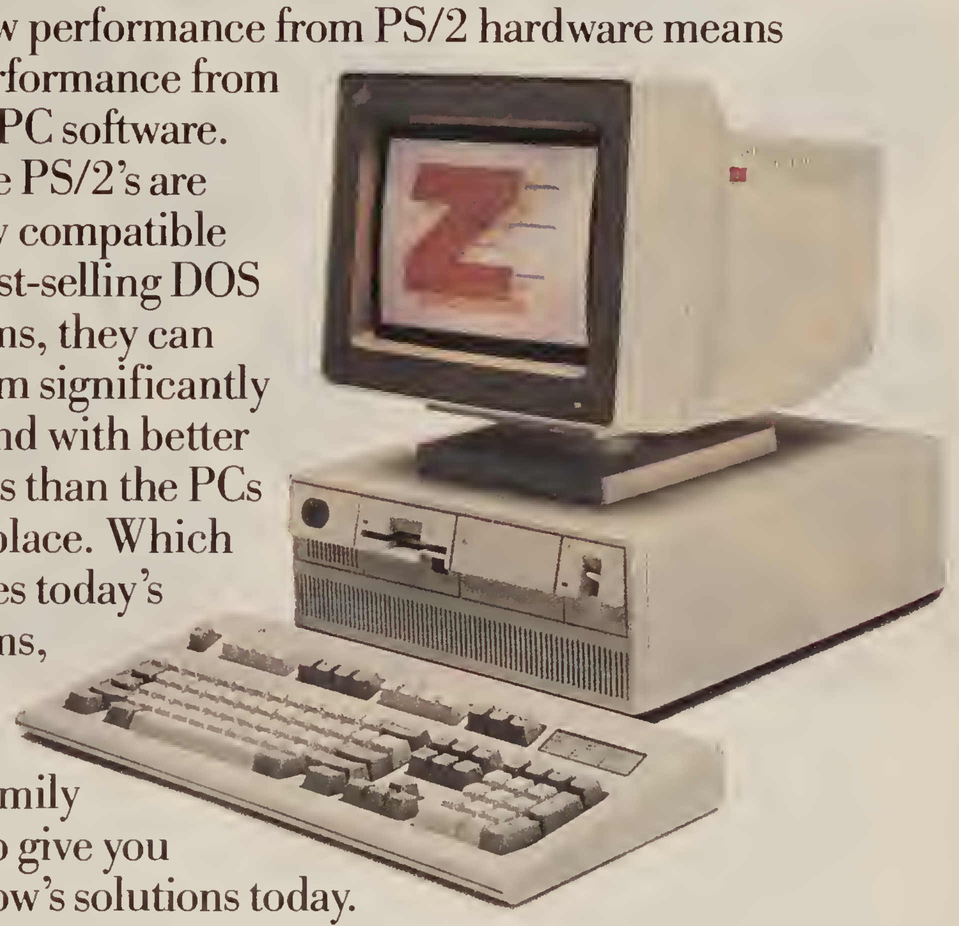

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IBM The Bigger Picture

*Based on performance data developed by NSTL for IBM in May 1988 using seven popular applications. Test results showed that depending on the application, the IBM PS/2 Model 70 A21 ran up to 25% faster than a leading 20 MHz 386 PC with memory cache. The Model 50 Z ran up to 35% faster than the original Model 50. Actual results may vary. IBM, Personal System/2, PS/2, Operating System/2, OS/2 are registered trademarks. Micro Channel and AIX are trademarks, of IBM Corporation. © IBM 1988

Network delivers for Domino's

BY KATHY CHIN LEONG
CW STAFF

ANN ARBOR, Mich. — Does your pizza stick to the box lid by the time it arrives at the door? Worse yet, does it ever get delivered to the wrong address?

Domino's Pizza, Inc., in a creative plan to sweeten customer service, has created an automated ordering service designed to deliver the popular delicacy in 23 minutes or less. For the first time, Domino's is using technology as a way to obtain a larger slice of the market pie.

The ordering service consists of a nationwide proprietary network of NCR Corp. mid-range computers featuring customized ordering software. The software was developed internally in order to support the peculiarities of the business. It keeps track of the number of pizzas sold in one day, the most popular pizzas, the names and addresses of each customer and the time of orders.

"We saw this as a way to expand our business and control costs," said Tom Pecott, Domino's national director of information services. Pecott runs the project with eight MIS staff members.

"We are always working on reducing delivery time," he said, adding that so far, the new system has achieved a 5% cut.

While the initial NCR prototype was locally implemented in 1985, the project has gained significant momentum in the past year. There are 120 stores currently using the network, and by the end of the year, the company will have deployed the minicomputer technology in 400 of its 1,200 corporate-owned outlets. The company also has another 3,300 franchised stores that will have to decide whether they want to implement the same system.

At the heart of the system is a network of NCR 9300, 9400 and 9500 mid-range computers. The NCR proprietary wide-area network consists of dedicated leased lines linking eight cities, which span the country from Columbus, Ohio to Miami. One NCR computer is deployed at each of the eight nationwide order centers, and an NCR Tower is located at each outlet.

One number fits all

The system saves customers the hassle of searching the phone book for the number nearest their homes. Domino's advertises just one phone number for a region and has situated the calling centers so that every order is a local call. At these centers, Domino's employees enter the telephone orders and transmit them to the closest store.

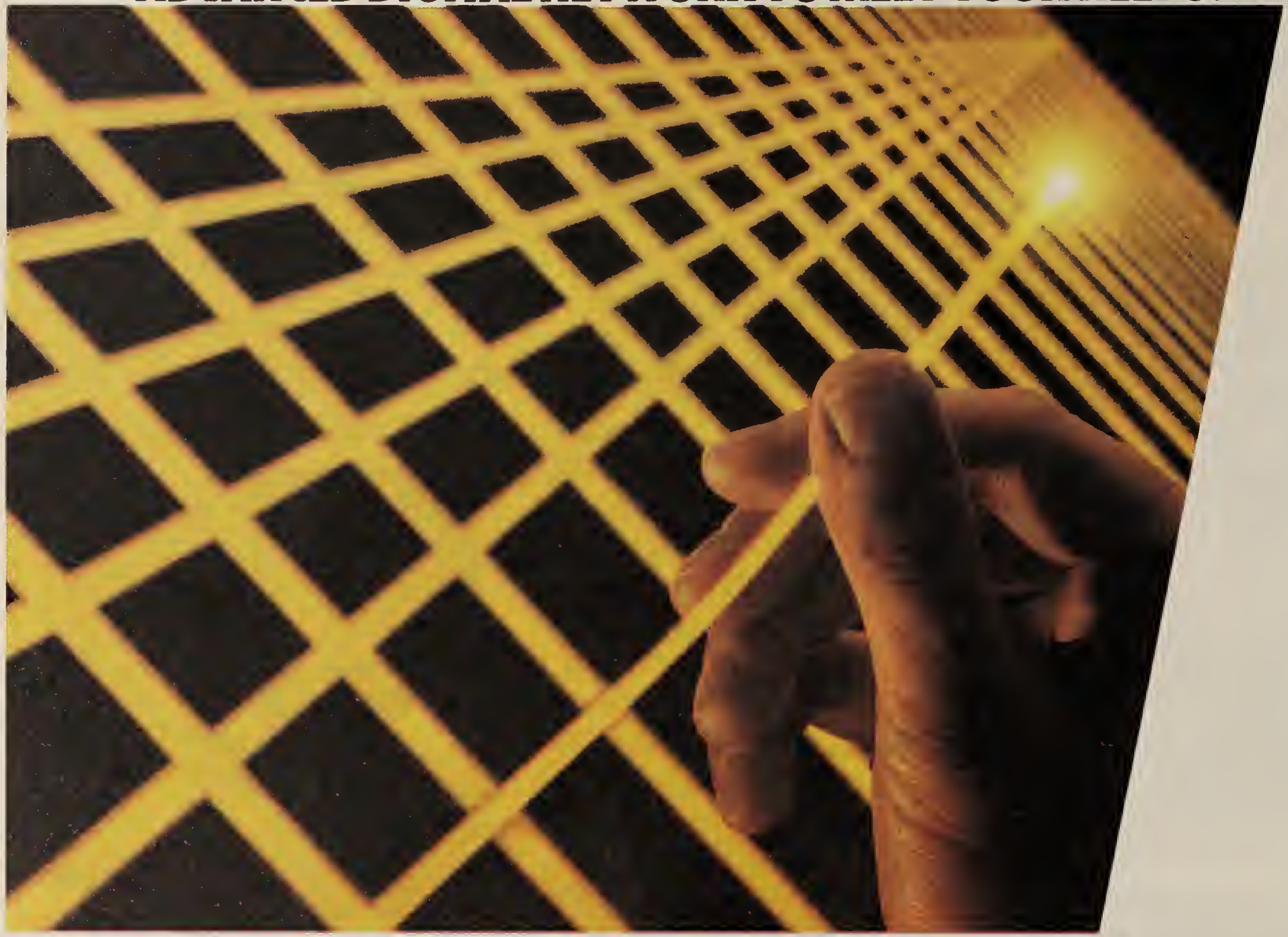
Orders are processed through an NCR Tower and sent to a printer at the pizza outlet. A printout serves both as a customer receipt and order record. Before automation, each store answered its own phones, and employees scribbled orders on tickets.

So far, the company has invested less than $5 million in the turnkey system. NCR hardware was selected for its price, nationwide service presence and durability. "A pizza store is not exactly the best place for a computer. There is always a lot of flour in the air, and the heat is extreme. We had a lot of environmental factors to consider," Pecott said.

The company started the project as an experiment. "We just wanted to see if the concept of automated ordering and computerized record keeping would make sense," he said.

Eventually, Pecott said, the company would like to link up its independent ordering network into its main data processing operations, which are based on an IBM 4381 located at its Ann Arbor headquarters.

Currently, the stores do not upload data collected daily in the central mainframe. Such a linkup would require Domino's to develop a custom interface. However, the effort would give the company an opportunity to see how well the individual stores do on a daily basis.



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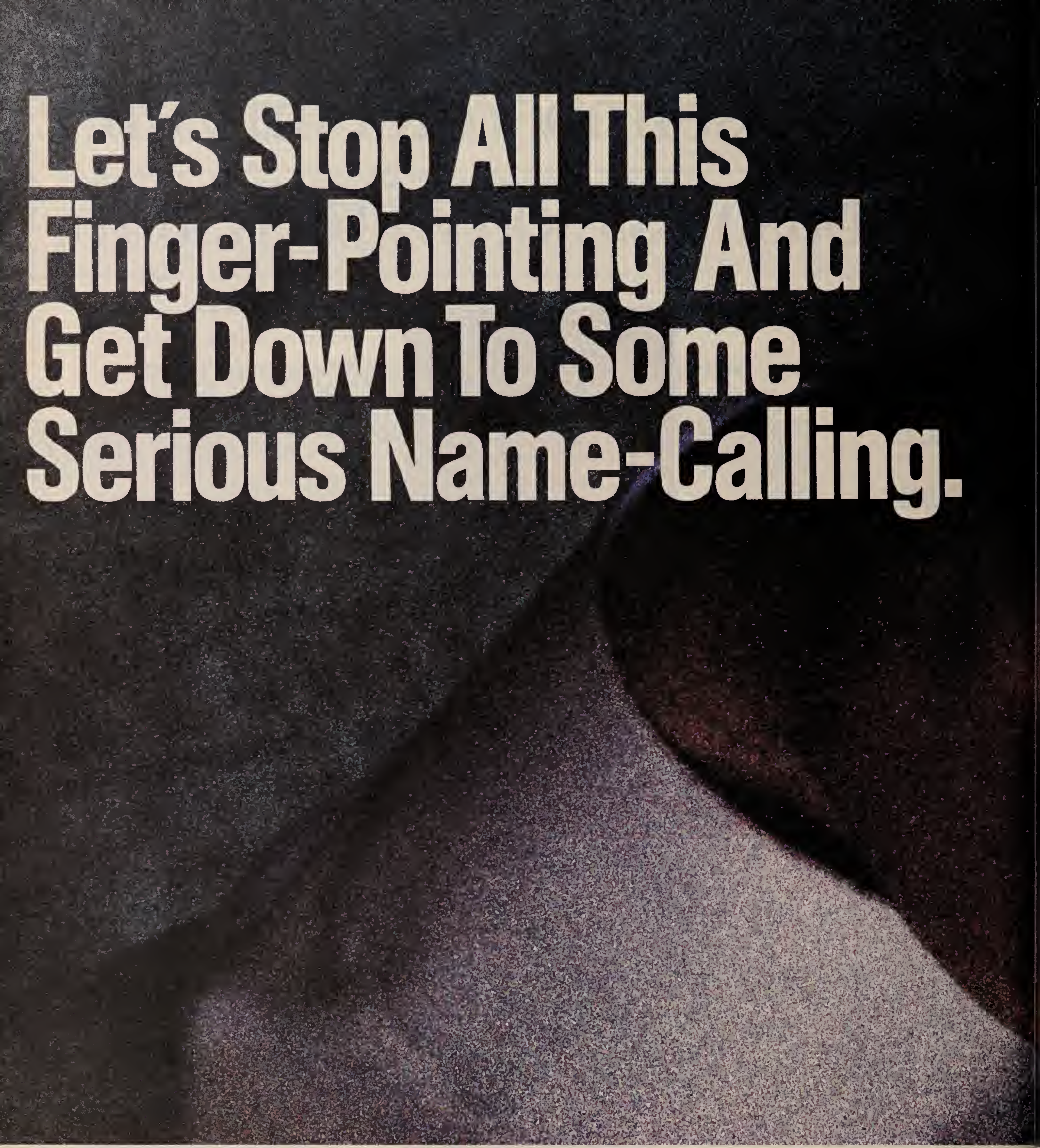
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Net parade

FROM PAGE 49

integration services.

A host of communications resellers, systems integrators and consultants have long aided users struggling with networking concerns, but the vendor community has only recently begun to make a strong push in that direction. And although some vendors have provided some of these services, they have rarely been organized under a formal program.

> IF USERS cannot get what they need from their vendors, some of them are prepared to build it themselves, using generic tools.

There are at least two factors driving the trend toward vendor-packaged network design services: the demand for and growth of network management systems and the movement toward open systems.

At the same time that customers are trying to become more self-reliant, vendors are looking to make a buck in other areas, according to Jeffrey M. Kaplan, director of network and professional services at The Ledgeway Group, Inc., a consulting firm in Lexington, Mass.

Service first

In addition to Apollo, Hewlett-Packard Co. and Northern Telecom, Inc. have also recently launched a joint venture — Corporate Networks Operation — said to provide network consulting, design and custom integration services.

Also, Sun Microsystems, Inc. offers similar workstation-based capabilities via Sunclass and Sunguard. The Sun products are offered by Infinet, Network Equipment Technologies, Inc. and Timeplex, Inc. BBN Communications Corp. is a customer of Apollo, Kaplan said.

Sun and Apollo have both taken a two-pronged approach. Each serves as a supplier to other vendors seeking to support their proprietary systems and also targets end users with stand-alone network management-type systems, Kaplan said.

The two companies "offer the user the workstation as a tool to enable network configuration without worrying about what kind of equipment is involved," he said.

Conversely, communications companies are finding themselves at a crossroads. While they are obligated to help their customers better configure their networks and must provide the tools to do so, they do not want to give users the weapons to become more independent.

But as the barriers between proprietary systems begin to tumble, these same vendors are seeking alternative sources of revenue. Also, in an open systems-oriented market, if competitors offer the same or similar standards-based equipment, helping users lay the groundwork for their network strategies may provide vendors with an in and a much-needed leg up in the battle for market share.

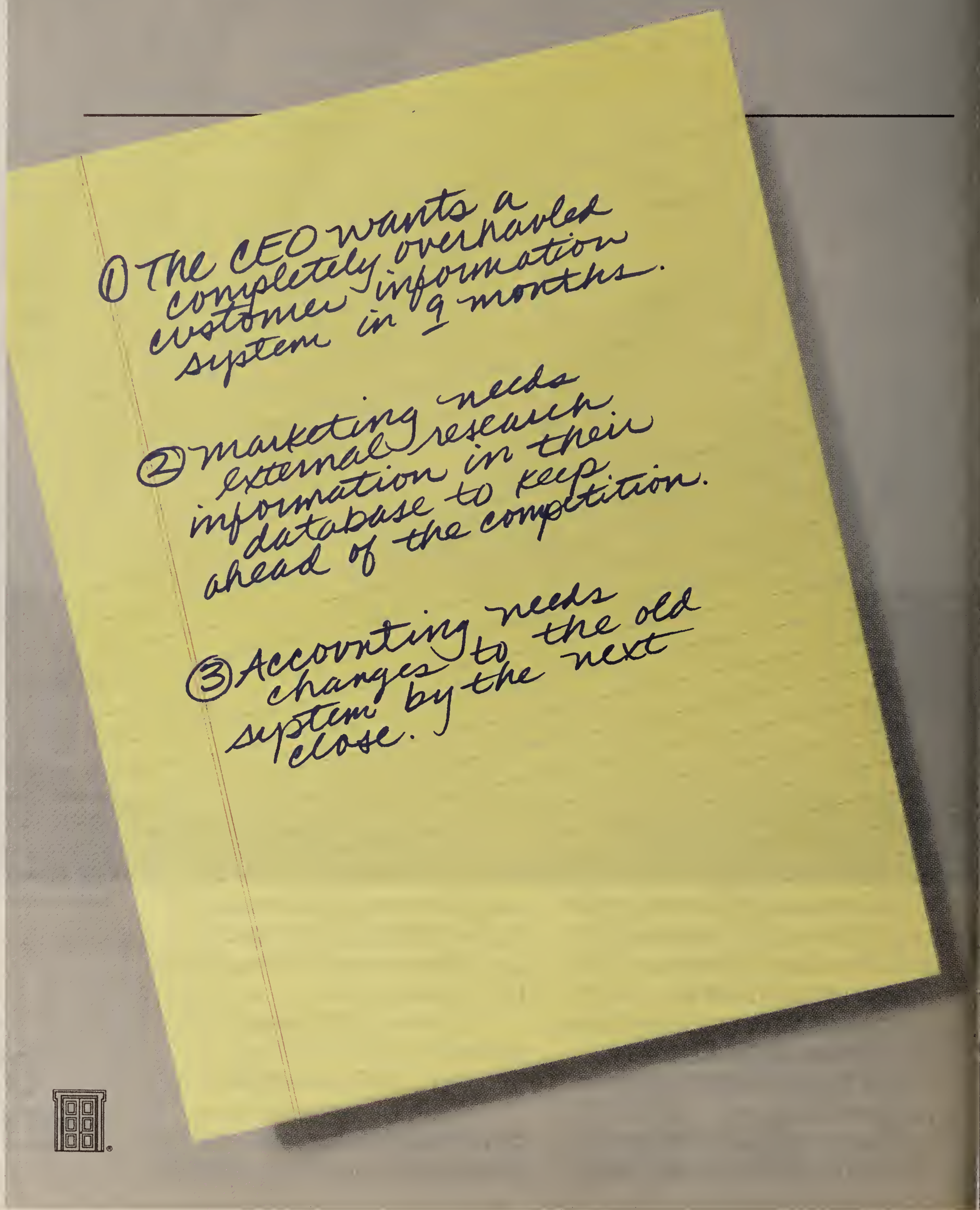
Also playing a role here is the slowdown in network equipment sales, according to Kaplan. "The buying and procurement cycles have really slowed down. Users are adding to their networks but with incremental purchases," he said.

The reason goes back to the need for network management: Many users have put further network expansion on hold until they succeed in gaining control of what is already installed. And if they cannot get what they need from their vendors, some of them are prepared to build it themselves, using generic tools.

While vendors that offer network design and management services are, of course, hoping to sell their own equipment, savvy users can still use this assistance to solve, or at least better address, some of their network problems — even if they do not end up buying from the particular vendor.

"Nine times out of 10, [the Corporate Networks Operation] will come up with an HP-Northern Telecom solution," Kaplan said.

How Would You Deal With These Problems?


① The CEO wants a completely overhauled customer information system in 9 months.
② marketing needs external research information in their database to keep ahead of the competition.
③ Accounting needs changes to the old system by the next close.

3Com execs

FROM PAGE 49

ment style between Bill and Bill Krause?

Carrico: There's no question about the differences in style. I'm more on the pragmatic side. I have been described as quick to take action and detail-oriented. Bill [Krause] is more principle- and process-oriented.

But I don't think these differences materially affected the decision to leave. I was in a situation where I had been the general manager and CEO [of Bridge], and overnight we doubled the size of the company. I was then required to operate through six levels of general managers. I missed some of the more hands-on capability of a smaller company.

Estrin: For me, it was more of the inverse. I went from being second [in command] to being division manager of a larger company. I missed the breadth [of my responsibilities] before the merger. None of these issues are particular so much to 3Com and Bridge, it's just something that happens when you go through a merger.

You are both perceived as the heart of Bridge. How do you think your departure will affect the company?

Carrico: Certainly there's concern about maintaining Bridge's momentum. Toward that end, [3Com cofounder] Howard Charney, an outstanding people manager, will be Bridge's general manager.

Estrin: I talked to a fair number of large accounts during the last week, and the overriding theme was that while they enjoyed their business relationship with us, they believed that 3Com was a professional organization committed to continuing the support they were accustomed to from Bridge.

How about a report card on the merger — what is the most substantial payoff to date?

Carrico: Mergers are harder than you think. Bridge's direct sales force is already selling something like six times as many 3Com products as they were premerger.

Plus, there's a lot of product synergy in process. One of the biggest successes is the combination of the international sales forces, to the extent that 33% of the combined sales today are international.

Is 3Com dragging its feet on utilizing a direct sales force?

Carrico: I think we've gone more direct. Clearly we are trying to sell to larger accounts. We've started to achieve that, but you don't make the shift overnight. We're still encouraging large accounts to choose [equipment delivery] through resellers.

Estrin: Selling through the direct sales force has definitely made large accounts more comfortable about buying 3Com. With these accounts, it's not how they buy, it's how they are supported.

What are some other issues facing the two companies during the next 12 months?

Estrin: It's very important to be thought of not as two, but as one company with the full breadth of solutions and systems for customers. Bridge can be thought of as a product line.

Carrico: We have to bring 3+ Open out in volume. On the Bridge side, we are anxious to bring out internetworking bridge products.

You'll continue to see more announcements in the PC-to-host arena, as well as some [IBM Personal System/2 Micro Channel architecture] announcements and a big push to get Ethernet over twisted-pair cable out in volume.

In hindsight, would you go through it again?

Carrico: Absolutely. You can see the evidence around you, the reasons we chose to do the merger. We felt inevitably there had to be consolidation, but we wanted to pick who we consolidated with. In order to be significant players [in a maturing product market] in the long run, you've got to have critical mass to survive.

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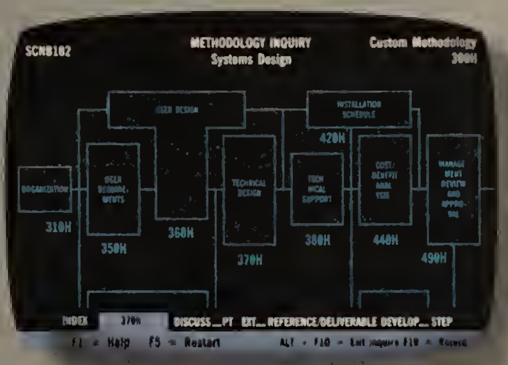
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490H
INDEX
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DISCUSS_PT EXT_REFERENCE/DELIVERABLE DEVELOP_STEP
F1 = Help
F5 = Restart

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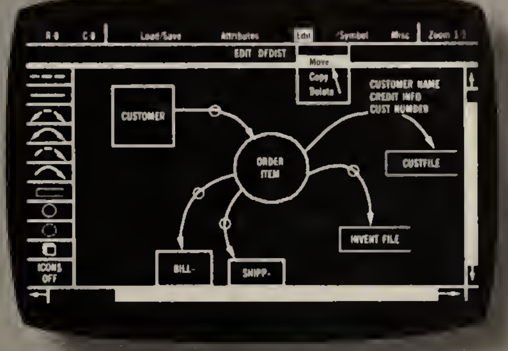
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ENTITY TYPE
ITEM ID
DESCRIPTION
ORDER DATA
REL DIRECTION
CHILDREN LIST
DIVISION
ENVIRONMENT
READ
UPDATE
DELETE
ENTITY ID
ITEM ID
TYPE
SEQ
DESCRIPTION
STATUS
CONTAINS
CUSTOMER-NUM
PROMISED-DATE
ORDER-DATE
SHIP-TERMS-CODE
SHIP-VIA-CODE
SHIP-TO-ADDR-1
SHIP-TO-ADDR-2
AR-TERMS
SHIP-TO-ADDR-3
CD-TERMS-DESC
SEARCH
01-HELP
02-ITEM DETAIL
03-END
04-FIRST
08-DOWNWARD
09-CANCEL
EN-PROCESS
A1-REFRESH
NEXT FUNCTION
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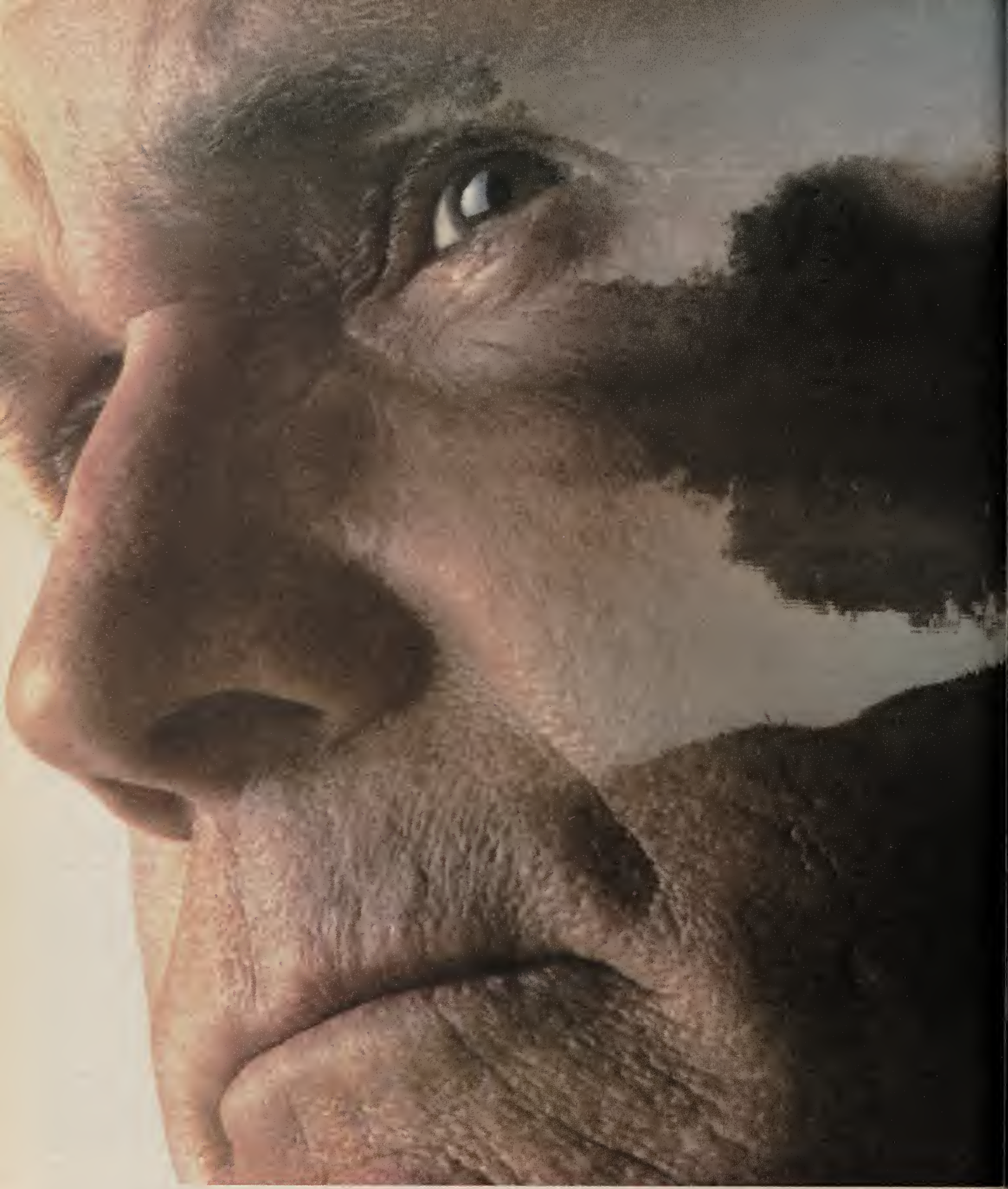

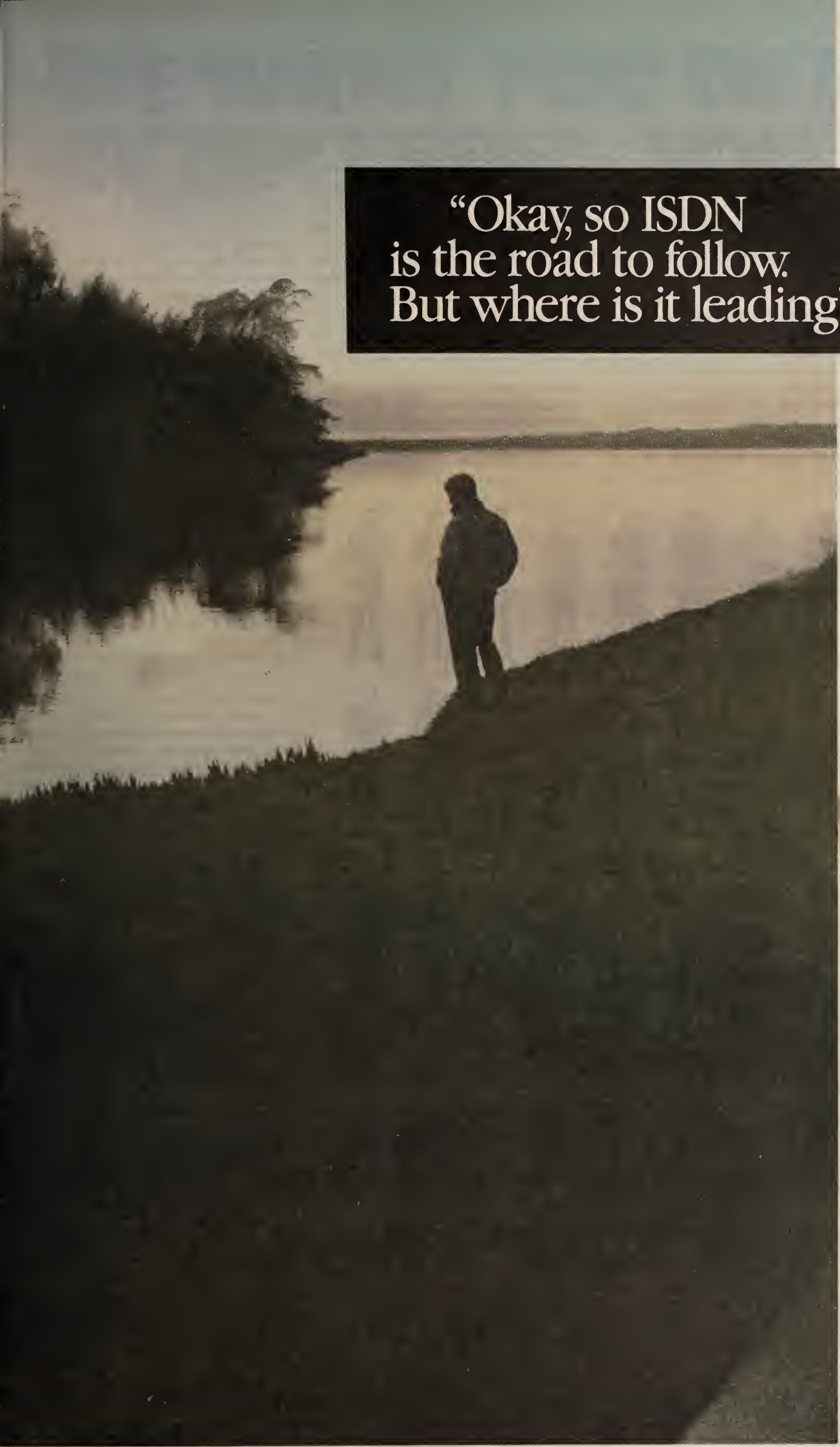

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3Com backs up Netview

BY JAMES DALY
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. has thrown its support behind IBM's Netview host-based network management system with an integration strategy, promising the release of Netview-based products by year's end.

3Com's Network Control Server (NCS) will spearhead the company's attack and serve as the foundation for a centralized network management system for Ethernet or token-ring networks.

NCS will collect alarm information and audit trails of network performance statistics from 3Com devices and, in turn, will pass the information via the Netview/PC interface to the Netview operating system in the IBM host.

Software support pending

The firm said the NCS-to-Netview bridge will be completed in November or December, at which time it plans to release a pair of software links that will facilitate the collection of alarm and audit trail data from the network.

These releases will include Alert Monitor, a Microsoft Corp. LAN Manager application that monitors work group alerts through standard OS/2 LAN Manager application programming interfaces and forwards them to a Netview/PC node on the LAN, and Alert Forwarder, which forwards alerts coming from Alert Monitor to Netview on the host.

One kink in the strategy is that 3Com indicated it would release the Alert Monitor and Alert Forwarder when IBM offers a version of Netview/PC that runs under OS/2. However, IBM has not yet said when such a product will be released.

Phased implementation

Initial implementations of the 3Com products will support communication of alerts to the mainframe over a serial line. Later releases will support the transmission of commands from Netview to NCS.

In its planned integration of OS/2-based work group networks into the Netview environment, 3Com said it will concentrate on evolving its work group server operating system to the OS/2 LAN manager as part of its 3+ Open product line and as part of IBM's plans to move Netview/PC into the OS/2 environment.

3Com added that it will further its integration base early next year when it unveils network management tools for Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect networks. An early version of its TCP/IP network management software will be shown at the TCP/IP Interoperability Conference this September in Santa Clara.

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Mr. Wayne Gajkowski, Senior Systems Analyst
Mr. George MacDonald, VTAM Specialist
Northwestern Mutual Life Insurance Co.

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Driven by a powerful Network Control Language, NET/MASTER not only helps decrease downtime, it helps cut costs at Northwestern Mutual. As VTAM Specialist George MacDonald points out, the system's multiple sessions capabilities have allowed his company to delay hardware purchases and, in many cases, hardware upgrades as well as improve productivity. "I wouldn't want to have to manage a network like ours without something as high quality as NET/MASTER," said MacDonald, whose company also utilizes SUPRA™ and MANTIS® from Cincom. "There's just no way in the world to do it."

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BIT BLAST

Rockwell in new format

Rockwell International Corp. in Richardson, Texas, has consolidated its telecommunications, data communications and semiconductor businesses into a single entity named **Rockwell Communication Systems**. The new firm will focus on networking applications and transmission and customer-premise data communications equipment. It will have three divisions: Network Transmission Systems, Switching Systems and Semiconductor.

Last week, Rockwell International agreed to acquire **Communications Machinery Corp. (CMC)** in Santa Barbara, Calif. CMC makes Digital Equipment Corp.-compatible hardware- and software-based communications products. Rockwell said it expects to complete the merger by July, at which time CMC will become a subsidiary of Rockwell Communication Systems.

Integrated Network Corp. has announced that **U.S. West** will purchase Integrated Network's Universal Switched Data Capability high-speed data transmission system and deploy it in six states. Integrated Network also said it has raised $11.6 million in additional funding, increasing total investment in the firm to $17.3 million.

Ralston Purina Co., the world's largest animal-feed manufacturer, has contracted with **McDonnell Douglas Information Systems Group** to handle its data and information processing. The pact also gives Purina usage rights to McDonnell Douglas's commercial communications network, several business support applications packages and Ontyme electronic mail.

Tellabs Communications Canada Ltd. has signed a contract for an estimated $2.5 million in U.S. funds to supply statistical and packet-switching multiplexers to **Bell Canada**.

Digital Equipment Corp. and **Pilot Executive Software** have announced a cooperative agreement to market a comprehensive interface that will link Pilot's Executive Information Systems product to DEC's All-In-1 office automation system.

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Sniffer net gets on track

BY KATHY CHIN LEONG
CW STAFF

MOUNTAIN VIEW, Calif. — Network General Corp., maker of the Sniffer network protocol analyzer, has introduced a laptop version for the Ethernet market.

Laptop Sniffer is said to be geared toward users who need a single networking architecture.

The laptop version is a protocol analyzer based on a Toshiba Corp. T3200, which is an IBM Personal Computer AT compatible. It reportedly works with a variety of Ethernet protocol suites, software and implementations, including Transmission Control Protocol/Internet Protocol, Digital Equipment Corp.'s Decnet, Xerox Corp.'s Xerox Network Systems, Sun Microsystems, Inc.'s Network File System, IBM's Netbios and Novell, Inc.'s Netware.

The $15,000 analyzer gives users a graphical display of network activity, featuring remote monitoring capability via a separate personal computer and telephone line.

While the software monitors basic network functions such as cabling disorders, it also keeps track of data activity while packets are sent between devices and pinpoints bottlenecks.

The original Sniffer allows users to select up to two network architectures ranging from token-ring to Arcnet, Ethernet and Starlan. Laptop Sniffer will support other network types in the future, said Harry Saal, president of Network General.

Look out, Lanalyzer

Laptop Sniffer is aimed at competitor Excelan, Inc.'s Lanalyzer, a product that also tracks Ethernet protocols.

Stanford Medical Center in California is currently beta-testing the product. According to Phil Fernandez, the center's network systems manager, Laptop Sniffer is significantly faster than the original Sniffer and, further, has a cleaner, simpler user interface.

"So far, so good," he said. "We are able to take advantage of the capabilities to address real networking problems."

Meanwhile, Saal hinted that the original Sniffer will gain support for Apple Computer, Inc.'s Appletalk network and Banyan Systems, Inc.'s Virtual Networking Software, or Vines, later this year.

Hopes

FROM PAGE 49

high-end devices, LAN to LAN and workstation to workstation. According to proponents, FDDI is the first attempt at standardizing an interface for devices that will ride on a fiber-optic local-area network. Today, users must opt for a variety of proprietary methods, none of which make it easy for them to just plug in a device after opening the box.

Gives it credit

American Express Vice-President of Communications Al Crawford said his company is already laying down plans to implement FDDI, even though the protocol specifications have not been finalized.

"We are proactive in the FDDI standards committee. It will be a cost-effective way of building large networks," Crawford said. "We are hoping that we can start implementing some pilots in 1989."

If all goes well in the standards committee, Crawford's dream might come true. Pieces of the FDDI standard include the Media Access Control layer, the Physical layer, the Physical Media Device layer and Station Management. Of the four components, Station Management — the parameters that specify how a station should pass a token around the network, for example — is the least developed.

Alan Chase, Eastman Kodak's manager of network engineering, said Kodak is embracing FDDI "all the way. Even though it is an emerging protocol, we see it as fundamental in the way we tie together our LANs here. It is a key component to our architecture."

Although Kodak operates proprietary backbone fiber networks that run at 400M bit/sec. on its campus, Chase said the 100M-bit FDDI network would be integrated as subnetworks alongside the backbone fiber. Kodak is expected to implement FDDI in 1992, Chase said.

Aside from corporations, universities are also waiting for FDDI to come to fruition. Stanford University in Palo Alto, Calif., runs an extensive fiber network across its campus for voice and data.

Learned a lesson

"We definitely need it," said Bill Yundt, Stanford's director of networks and communication systems. "We are using Ethernet over fiber right now, and the the 10M-bit speed is not fast enough for us. We need to create new paths for data transmission." FDDI applications for Stanford would include using high-speed interfaces into mainframes, he said.

When FDDI is complete, the vendor world will peddle wares such as super-performance file servers for improved file access. Some workstations, for example Sun's Sun-4, will be able to crunch numbers at faster speeds across network boundaries.

Companies like Proteon, Inc. also say they will be offering an FDDI migration path for their own network products. According to Proteon Chief Scientist and Chairman Howard Salwen, the Proteon Pronet-80 fiber LAN is very similar to the FDDI network specification, so that migrating its products over to the final FDDI protocol will be relatively easy.

Network vendor Communications Machinery Corp. and chip maker Advanced Micro Devices, Inc. (AMD) have joined together to develop and market FDDI VMEbus processors. Under the contract, Communications Machinery will use the AMD five-chip set to create boards that will also integrate Transmission Control Protocol/Internet Protocol and International Standards Organization software protocols.

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White

FROM PAGE 49

Program Communications is any guide, it would be reasonable to believe that Apple would support TCP/IP in the same fashion — by having a Macintosh II serve as a gateway server between Appletalk and TCP/IP nets.

Apple's twist

Finally, Apple has added its own twist to the interconnectivity equation. It believes Appletalk is an appropriate interconnectivity technology and should be supported by the rest of the world.

There are several problems with this thinking. In the first place, there are still perceptual problems about what Appletalk is. Many users and developers still believe that the Appletalk protocols exist only as they are implemented in Apple's Localtalk wiring scheme. While Apple has been doing a valiant job trying to educate these communities about the qualities of its networking scheme, much more work needs to be done.

Appletalk has many appealing characteristics and, in fact, is becoming an alternative standard for entry-level networks. But the world is simply not going to accept another internetworking standard.

IBM can impose one because of its size, but even DEC realizes it is better to try to work within industry standards and, toward that end, has implemented portions of OSI within Decnet.

Another question that must be raised is whether Apple's networking strategy is viable and/or adequate.

For a strategy to be viable, developers and users have to be able to understand the strategy and how it is important to them; Apple has done a poor job in this area. Most users queried by Infonetics are unaware of Apple's possibilities. Even the third-party development community is confused about Apple's program.

How will this confusion and lack of knowledge hurt Apple? First, the corporate user lacks confidence that Apple understands its global communications needs. Second, because of this concern, Apple will not be able to garner the fullest market share possible from that market. In turn, traditional IBM large-system third-party developers are not moving to support the Macintosh.

It appears these three problems will cause Apple serious concern in the future. Although Apple has enjoyed a surge in acceptance by the corporate buyer, the honeymoon can end as soon as it began if Apple does not change its image from a workstation company to a corporate computing company.

Since Apple is not likely to be selling minicomputers and mainframes, its only method to achieve this objective is through its communications strategy.

Apple needs to take the same leadership role in corporate connectivity that it has with easy-to-use workstations. Apple must innovate within the world of communications standards. One of the most powerful ways is to develop applications that demonstrate Apple's capabilities. It may be too late for Apple to wait for third-party developers to do the job.

This approach would be no different from when Apple introduced the first Mac. At that time, Apple also offered several application programs designed to show users the power of the product. This same type of demonstrative capability is required in networking.

Also important in Apple's strategy is the support of the corporate development community, something Microsoft has recognized in its attempt to market the OS/2 LAN Manager. However, Apple has all but ignored these people. Look at IBM's and DEC's success with controlling corporate connectivity, and you will see strong support for the corporate developer.

With all this said, does Apple provide effective ways to interconnect networks? The answer is: Maybe.

White is president and CEO of Infonetics, Inc., a market research firm based in Santa Clara, Calif.

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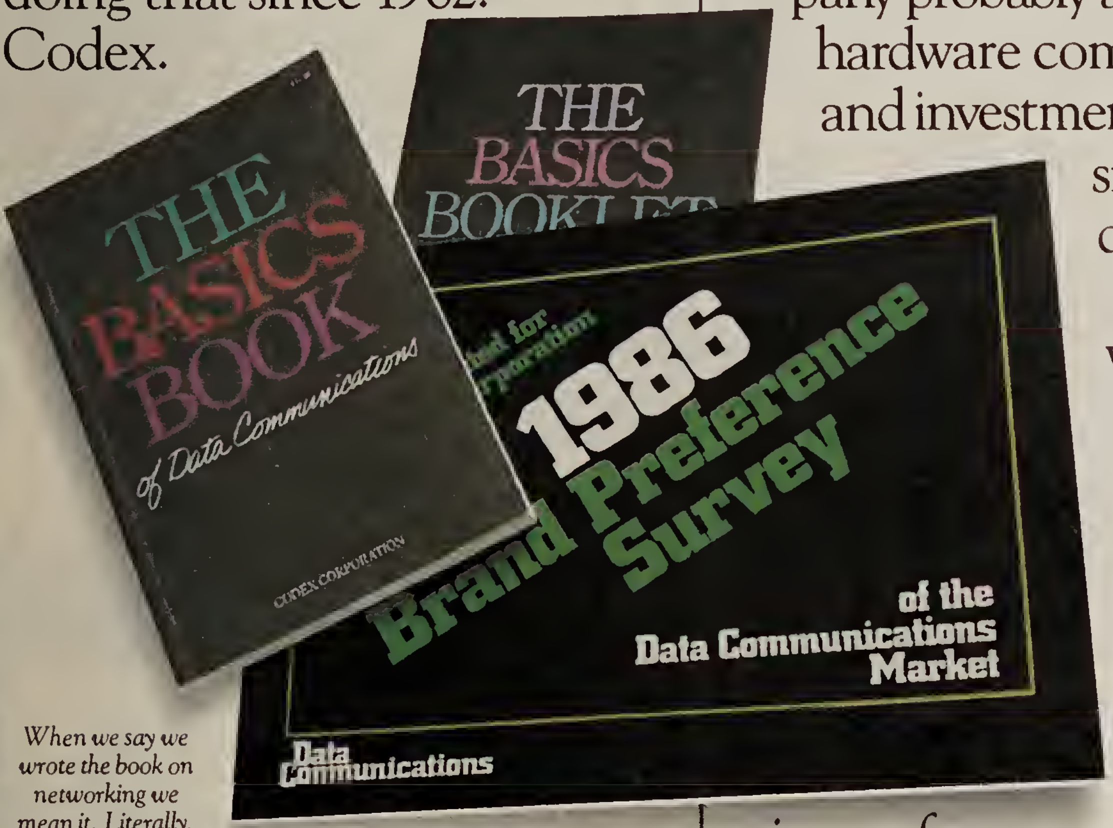
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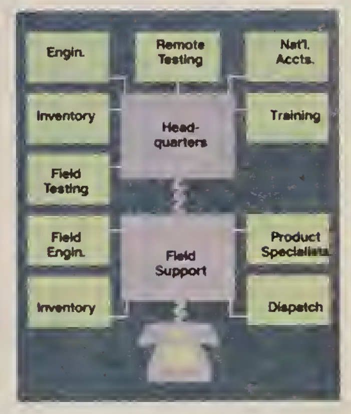
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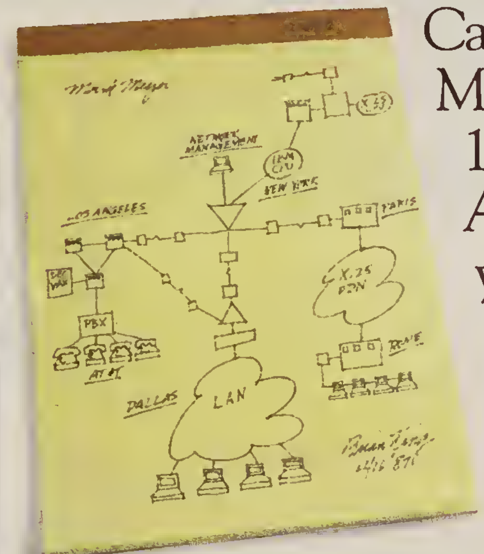
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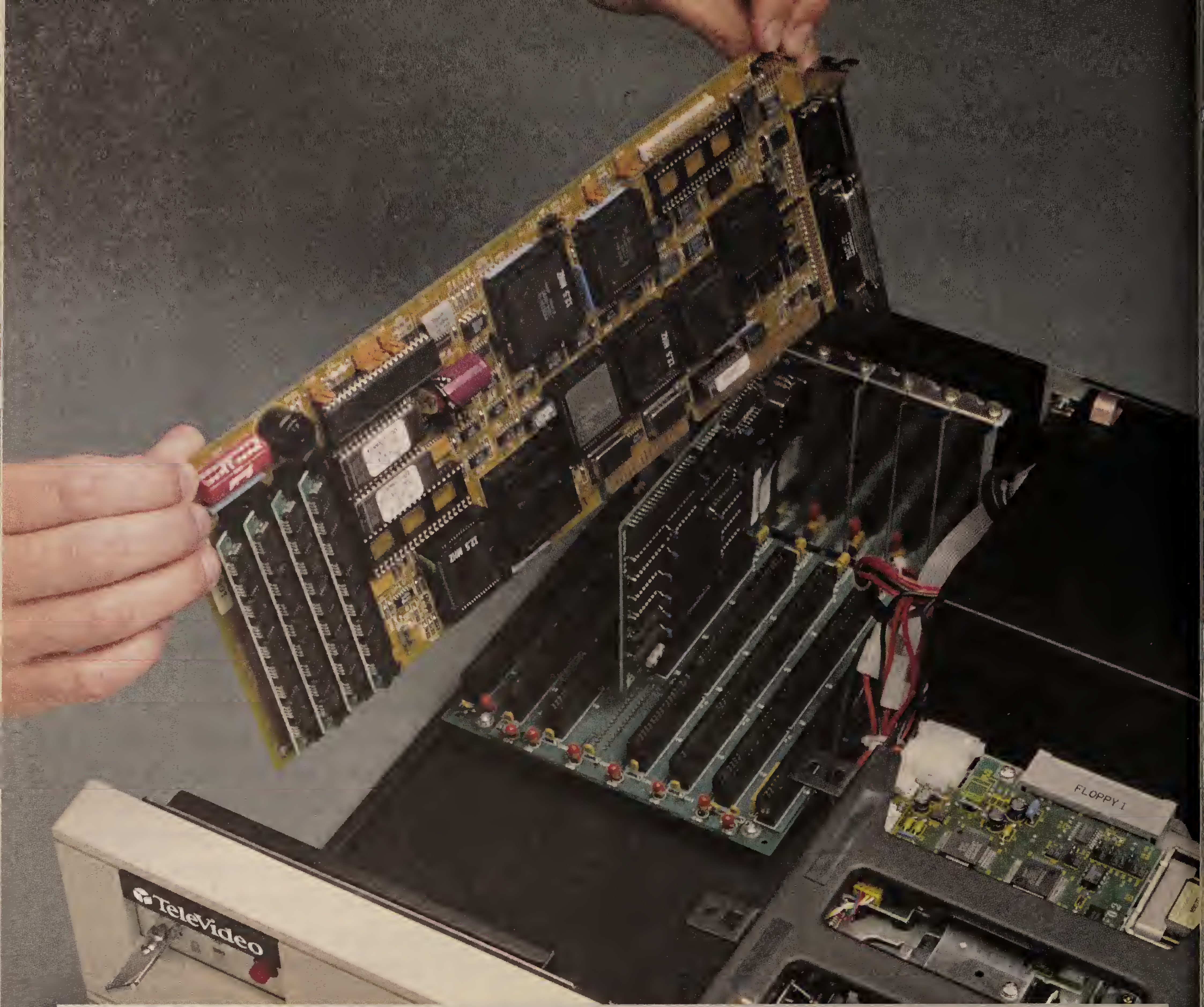

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The product uses a proprietary signaling technology for increased transmission efficiency. A modified version of carrier-sense multiple access with collision detection is incorporated to provide throughput and error checking. Diagnostic test software is included with each Netboard II.

Dealer prices for Netboard II are $139 for the 2.5M bit/sec. version in quantities of 10 and $169 for the 4M bit/sec. version.

PC Office, 4631 Viewridge Ave., San Diego, Calif. 92123. 619-268-3235.

Raycom Systems, Inc. has announced its **5300 series,** a line of fiber-optic and copper Ethernet products for connecting microcomputer, minicomputer and mainframes as well as peripheral devices. All conform to IEEE 802.3 standards.

Product offerings include fiber-optic transceivers and repeaters, a six- or 12-port hub, a fan-out unit, a six-port terminal server, a fiber-optic multiport repeater, a Thin Ethernet multiport repeater and a copper repeater and transceiver.

The products were designed to provide hybrid-media network solutions, including local-area networks that offer extensive geographic coverage as well as individual segments tailored to specific applications.

Prices range from $295 to $8,100, depending on quantities and configurations ordered.

Raycom Systems, 6395 Gunpark Drive, Boulder, Colo. 80301. 800-288-1620.

Local-area network software

FTP Software, Inc. has begun shipping **Netbios** for its PC/TCP network software. FTP claims its Netbios is fully compliant with the accepted IBM Netbios standard for Transmission Control Protocol/Internet Protocol (TCP/IP) specified in Request for Comments 1001 and 1002, which contain the formal TCP/IP protocol specifications.

Netbios for PC/TCP runs over PC/TCP 2.0, the vendor's TCP/IP software for personal computers running under DOS. PC/TCP allows PC users to transfer files, transmit electronic mail and access minicomputers and mainframes. PC/TCP is available for most Ethernet, token-ring and Starlan boards.

Netbios for PC/TCP costs $80 per copy.

FTP Software, 501 Cambridge St., Cambridge, Mass. 02141. 617-868-4878.

Easynet Systems, Inc. has announced **Version Two** of its local-area network product line for IBM Personal Computers and compatibles. The software is said to be 30% faster than previous Easynet products.

Version Two supports all IBM Netbios functions, including modem and facsimile sharing, and is designed for small to mid-size network requirements.

The product line includes **Easynet 116,** which incorporates a network card and software that permit peer-to-peer communications at 1.5M bit/sec. over twisted-pair cable. Also offered is a zero-slot LAN called **Easynet II** that allows two PCs or compatibles to share resources such as printers and hard drives.

Easynet 116 costs $695. Easynet II costs $169.

Easynet Systems, 4283 Village Center Court, Mississauga, Ont., Canada L47 1S2. 800-387-3207.

Links

Kinetics, Inc. has announced AUX support for the **Etherport II**, the company's Ethernet adapter card for the Apple Computer, Inc. Macintosh II.

The card provides support for Transmission Control Protocol/Internet Protocol, Digital Equipment Corp.'s Decnet, Open Systems Interconnect and Apple's Appletalk network protocols running under Macintosh OS.

The AUX software reportedly will give systems running AUX direct connection to an Ethernet network.

Etherport II, including Macintosh OS and AUX driver software, costs $795.

Kinetics, 2540 Camino Diablo, Walnut Creek, Calif. 94596. 415-947-0998.

Modems/ Multiplexers

A 2,400 bit/sec. Microcom Networking Protocol Level 5 internal half-card modem for IBM Personal Computers and compatibles has been announced by **ATI Technologies, Inc.**

The **2400 ETC** has a 16- and 32-bit digital signal processor with adaptive equalization. It is said to be compatible with the Bell 103 and 212A and CCITT V.22 and V.22 bisynchronous standards.

The 2400 ETC costs $239.

ATI Technologies, 3761 Victoria Park Ave., Scarborough, Ont., Canada M1W 3S2. 416-756-0711.

A fault-tolerant, 19.2K bit/sec. modem has been introduced by **Fujitsu America, Inc.**

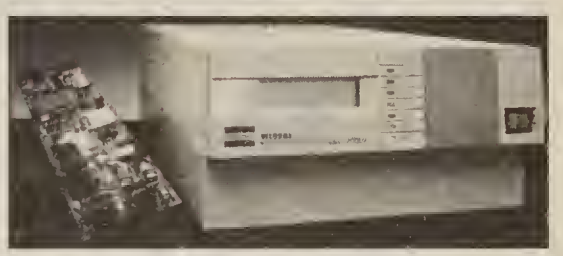
Called the **M1928LFT**, the synchronous, leased-line unit features monitoring and restoral capabilities.

By using a proprietary algorithm, the product can continually analyze a telephone line and detect impairments based on signal-to-noise ratio, carrier detect and signal quality.

The modem is Trellis-coded and will reportedly change its transmission facility to either a dial line or alternate leased line, depending on conditions.

The M1928LFT costs $5,295.

Fujitsu America, 3055 Orchard Drive, San Jose, Calif. 95134-2017. 408-432-1300.



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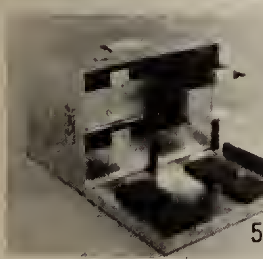
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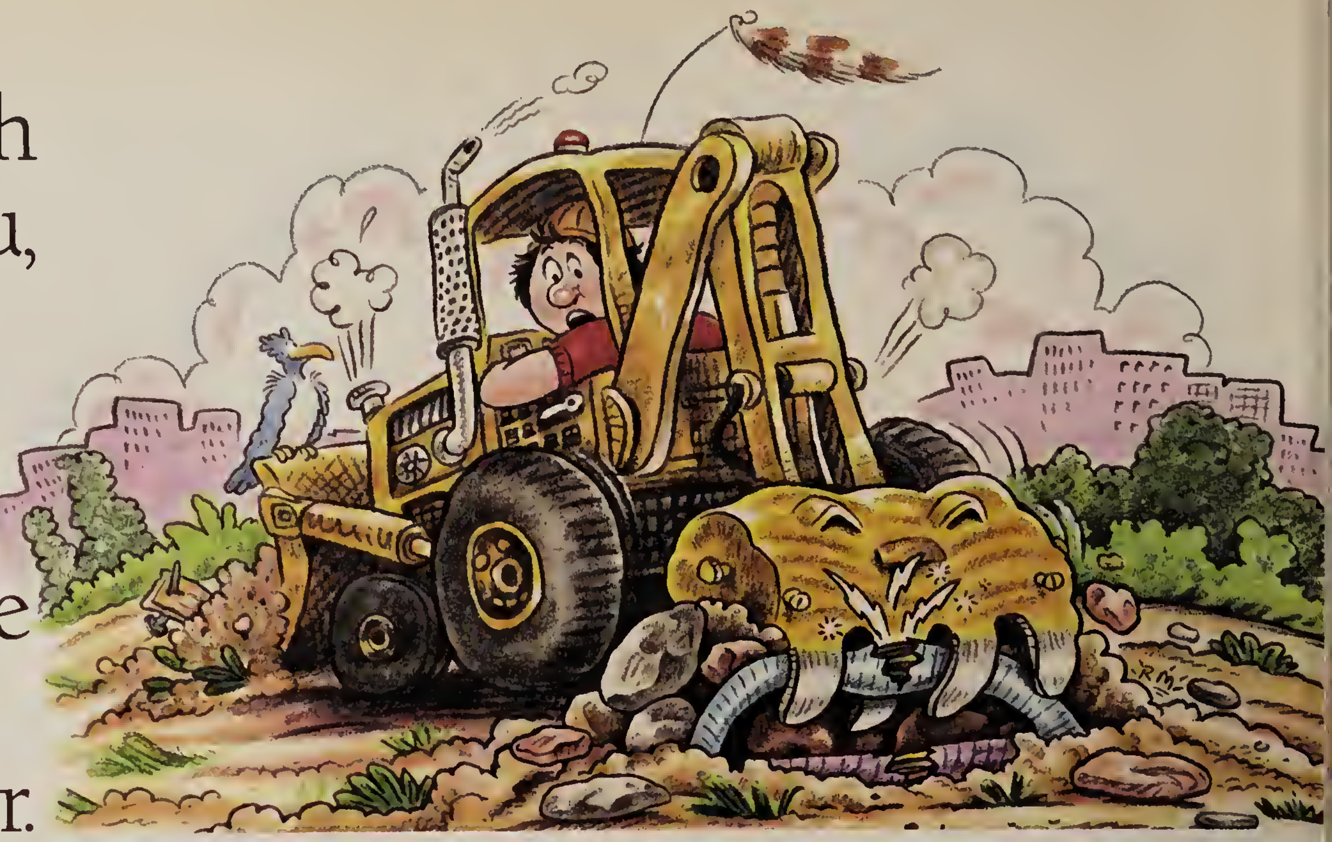

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SYSTEMS & PERIPHERALS

HARD TALK

Stanley Gibson

New minis tap old ways

How to attain success in the computer industry: Start users out with an easy-to-use system with much upward growth potential. Keep adding more power and operating system functionality while preserving users' investments in application software.

We have seen DEC succeed spectacularly with this method. It could be that IBM is about to repeat the formula with Silverlake — possibly with similar results.

Of course, IBM pioneered the practice with its 360 series in the mid-1960s. Then it added the closely related 370 series and subsequent mainframes that have protected users' software investments.

End of trend

IBM's divergence from this formula with an assortment of midrange architectures, each of them successful in varying degrees, is well documented. Silverlake is a turning point that will reverse that trend.

Silverlake will fill the need for greater capacity among System/36 and 38 users. These users will also be able to migrate to an operating system with greater functionality, or at least IBM Systems Application Architecture compliance, which is potentially a great advantage.

A System/36 user will never be faced with a complicated conversion to a System/38, and difficult communications between the two systems will be eliminated. Users have testified to some of the benefits they expect to see from Silverlake. [CW, June 6].

Mirror image

All signs point to the fact that Silverlake will mirror IBM's traditionally successful approach toward mainframe customers, in which the vendor leads them down a path of ever increasing power and operating system enhancements while preserving their fundamental investment in software.

Leading customers step-by-step to greater capabilities

Continued on page 78

Security firm finds IBM power

Switch to IBM from Decsystem-20s fills Chicago company's growth needs

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — In 1986, Security APL, Inc. had reached the end of the road. The small security-portfolio tracking firm, based here, needed more power than its aging Digital Equipment Corp. Decsystem-20s could provide. However, in 1983, DEC had announced it would stop enhancing the system and reportedly killed off the follow-on product, a 36-bit machine code-named Jupiter.

With its VAX architecture, DEC has reaped the benefits of a single operating system and hardware architecture. In the case of Security APL, though, DEC paid the price of having different architectures.

"The fact that we lost the migration path became a crisis," recalled Security APL President Jay N. Whipple III. To stave off a shortfall in processing power, Whipple purchased several used Decsystem-20s, bringing the firm's total to four machines.

System overload

Meanwhile, Security APL's growing caseload, boosted by booming New York accounts, was slowing down nightly batch processing of portfolio reports. The systems also supported daytime on-line queries.

"While we continued to live with our operating problems, we had to cut jobs in half in order to get them done on the Decsystem-20s," Whipple said.

The challenge, said Security APL Vice-President James K. Waller, was to provide better service to money managers in small to medium-size investment management firms.

Whipple, who founded Security APL in 1978, wrote the application that is the backbone of the company in the APL language, from which the firm derives its name. The program, which consists of 75,000 lines of code, includes an inverted-file data base and is used by 75 client brokerage firms to manage about 20,000 customer accounts. Security APL operates with a staff of 20 and reports $2.5 million in annual revenue.

As the work load mounted, Whipple said he realized that migrating to DEC's VAX would be as difficult as migrating to another system such as an IBM VM-based machine. "We began to look at the DEC and IBM machines as equal alternatives," Whipple said.

Despite the company's small size, both DEC and IBM were keenly interested in the Security APL account. Both offered their own solutions to the capacity problem. DEC's answer was to migrate to a Microvax II under the VMS operating system. IBM proposed a plan to install APL on an IBM 9370 under the VM operating system. Both the 9370 and the Microvax II support the APL language.

That was when IBM and DEC went toe-to-toe for the Security

Continued on page 78

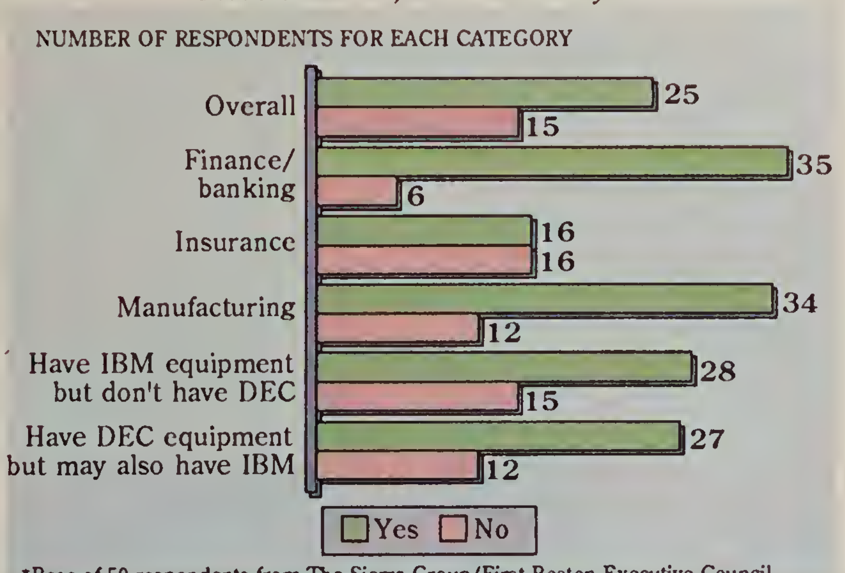
Inside

- McDonnell Douglas helps in highway project. Page 72.
- Emulex brings disk, tape controllers to Microvax computers. Page 76.
- Arnet expansion boards transform IBM PCs into multiuser computers. Page 82.

Data View

DEC's multiprocessors up ante for Silverlake

*When asked if DEC's latest VAXs will set new standards for evaluating IBM's Silverlake, MIS execs said yes**



*Base of 50 respondents from The Sierra Group/First Boston Executive Council

INFORMATION PROVIDED BY THE SIERRA GROUP
CW CHART

Rewind speeds subsystem

LOUISVILLE, Colo. — Storage Technology Corp. has boosted the performance of its 4480 Cartridge Subsystem, adding a faster rewind feature and 4.5M byte/sec. channel support.

The rewind feature, called the Velocity Option, reduces rewind time from 48 sec. to 32 sec. The high-speed search facility used by storage management software gains from the faster cartridge speed, Storage Technology said.

The 4.5M byte/sec. support allows the system to connect to 4.5M-byte channels on large CPUs, reducing channel management overhead and channel-busy status when multiple control units are on the same channel, according to Storage Technology.

Also, controller cache capability has been increased from 1M to 4M bytes.

The Velocity Option version of the subsystem and the 4.5M byte/sec. channel feature are slated to be available in the third quarter.

Each four-transport cartridge-drive Velocity Option is priced at $750. The 4.5M-byte channel support will cost $875 for each control unit.

Expanded cache will be incorporated into 4480 subsystems at the end of the year at no additional charge.

Avalon board shares memory to split VAX jobs

BY J. A. SAVAGE
CW STAFF

GLENDALE, Calif. — Avalon Computer Systems recently unveiled a processor board that shares memory with its host Digital Equipment Corp. VAX system. By sharing memory, the processor can execute portions of programs in parallel with the VAX system, according to the vendor.

Using the Vaccelerator board can speed processing by two to three times more than that of a VAX-11/780, the company claimed.

The Vaccelerator was designed for Q-bus- and Unibus-based VAX systems running compute-intensive applications. By offloading applications, it runs at many times the speed of the host, with the optional Weitek Corp. Floating Point Accelerator returning 95% of the VAX power to other users, Avalon claimed.

"The shared memory allows a user to divide a program into several sections," an Avalon spokesman said. "For instance, if you are charting wind flow over four different sections of an aircraft, [information from one section] is shared by the next board to perform the next calculation."

Based on an Intel Corp. 80386 processor, the Vaccelerator is aimed at compute-intensive applications like simulation, molecular orbital calculations and finite element calculations, according to the vendor.

'Perfect application'

"Star Wars [simulation] is a perfect application," the spokesman explained. "You don't have to build the [missiles] to see how they will react."

The Q-bus Vaccelerator comes standard with 4M bytes of memory, 64K bytes of cache memory and a Weitek 1167 Floating Point Accelerator and is priced at $11,900.

The Unibus model starts at 4M bytes of memory for $13,900, 8M bytes of memory for $16,300 and 12M bytes of memory for $18,700.

Applications may be ported to the Vaccelerator by recompiling existing Fortran, C or Pascal programs with compilers provided by Avalon. According to the company, those applications will execute transparently to the user.

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HARD BITS

Massachusetts signs on McDonnell Douglas

The state of Massachusetts is gearing up for work on a major federally funded construction project in Boston: The $3.1 billion depression of the Central Artery and the construction of a third Boston Harbor tunnel.

And the project, of course, will not be done without computers.

McDonnell Douglas Corp. recently announced that it had signed a five-year agreement to provide Massachusetts with the former's computer-aided design and drafting (CADD) software along with hardware and services.

Expected to take 10 years, the aim of the project is to lower a major highway underground and dig a third automobile tunnel under Boston Harbor, connecting Boston's downtown area with Logan International Airport.

The state Department of Public Works reportedly will buy the McDonnell Douglas Graphics Design System (GDS). GDS is a CADD software package that combines intelligent graphics with Oracle Corp.'s Oracle relational data base.

McDonnell Douglas, acting as the prime contractor, reportedly has subcontracted with **Digital Equipment Corp.** to provide the hardware necessary to operate GDS.

DEC said it will provide color Vaxstation 2000 workstations operating in local-area Vaxclusters in conjunction with the company's Microvax 3600 computers running DEC's VMS operating system.

The state said it will buy its first GDS package next month for $800,000. The package will be used by Bechtel/Pasons Brickerhoff, the management consultants overseeing the project.

Tandem Computers, Inc. recently announced a contract of a different kind with the Liquor Barn of Northern California, Inc.

The San Leandro, Calif., retailer purchased a Tandem Nonstop EXT10 system with software from PBL Associates in Point Richmond, Calif., to perform on-line inventory control, distribution and financial control.

"We carry more than 12,000 different products, including beer, wine, liquor and grocery items in 100 stores," said C. Giles Clarke, chairman of Liquor Barn. The Tandem-PBL system will keep track of each item and how well it is selling, according to Clarke.

Vanderbilt University in Nashville recently took delivery of a **Scientific Computer Systems Corp.** (SCS) SCS-40 system.

The processor, which San Diego, Calif.-based SCS calls a supercomputer, will be used in the university's chemistry department to run the CADPAC program, a chemistry application developed at the University of Cambridge in England.

"Price/performance was a major factor in our selection, as well as the SCS system's Cray compatibility," said B. Andes Hess Jr., professor and chairman of the chemistry department at Vanderbilt. He said the system will run the COS operating system.

Fujitsu Systems of America, based in San Diego, last week announced a $4 million order with Strawbridge & Clothier in which Fujitsu will provide the retailer with point-of-sale systems.

Based in Philadelphia, Strawbridge & Clothier operates 34 department and discount stores, which sell general merchandise in New Jersey, Delaware and southeastern Pennsylvania.

The system, which will connect users to a host on-line, includes Fujitsu's 7770 terminal, 7112 terminal-support processor and a number of 40M-byte disk drives.

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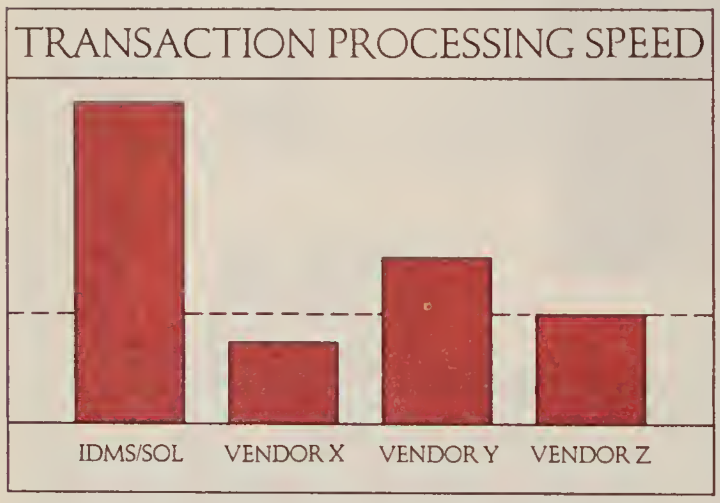
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Integrated Solutions revises CPU board

SAN JOSE, Calif. — Speeding up CPU performance, Integrated Solutions, Inc. recently announced a 25-MHz CPU board for its Optimum series of workstations.

The Optimum series, based on AT&T's Unix operating system, is intended to run with Integrated Solutions' proprietary real-time operating environment, Uniworks. The CPUs used in the Optimum line incorporate the Motorola, Inc. 68020 microprocessor. The new CPU board speeds processing from the 16.7-MHz 68020 chip that was previously offered.

The VME-68225 board can perform the Whetstone and Dhrystone benchmarks 30% to 50% faster than the previous CPU boards, the firm claimed.

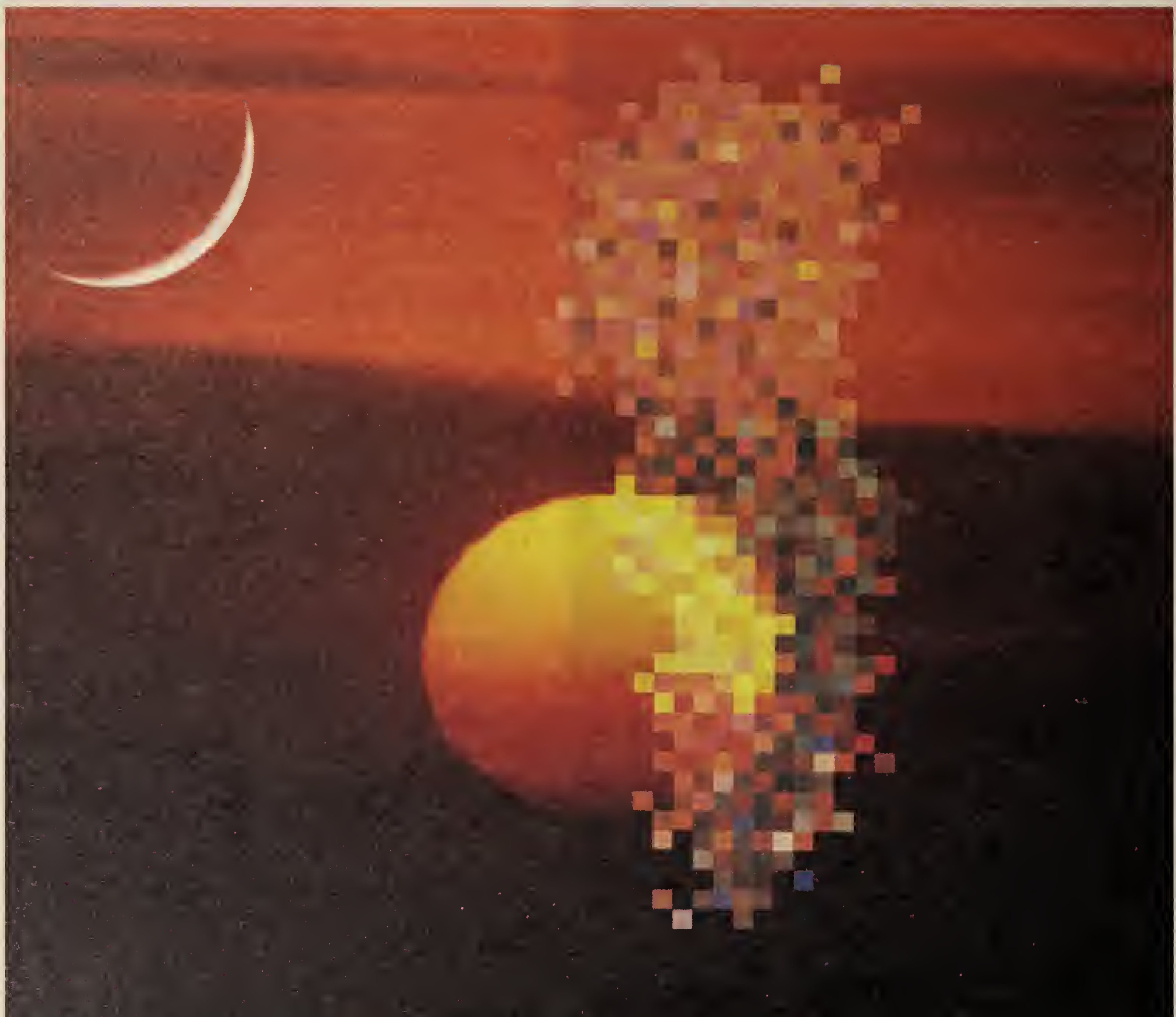
The CPU can access up to 32M bytes of random-access memory, more than double the Optimum series' previous limit of 14M bytes. The larger memory capacity will permit a system to support larger programs or more users.

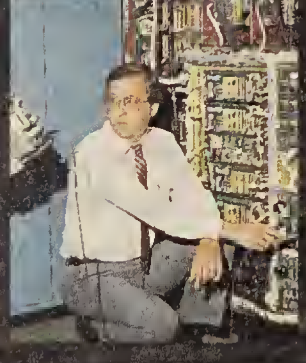
The VME-68225 plugs into a standard VMEbus and runs Integrated Solutions' Dual Universe Unix, incorporating the University of California at Berkeley's Unix 4.3 and AT&T's Unix System V, Release 3.

The CPU also supports such networking protocols as Sun Microsystems, Inc.'s Network File System and Transmission Control Protocol/Internet Protocol, both of which are supported in Integrated Solutions' version of Unix, the vendor said.

Sold separately, the microprocessor is priced at $3,900. It is also available in bundled configurations as part of the Optimum series. Integrated Solutions sells direct to users as well as through OEMs and value-added resellers.

The CPU will run all software currently running on Optimum series systems, the vendor claimed.





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Emulex plugs tape, disk controllers

BY STANLEY GIBSON
CW STAFF

COSTA MESA, Calif. — Emulex Corp. recently brought out disk and tape controllers for Digital Equipment Corp.'s Microvax 3500 and 3600 computers.

The Q-bus controller boards include the QD34 controller, which supports the System Module Device/Enhanced (SMD/E) interface, the QD24 disk controller, which supports the enhanced small device interface (ESDI), and the QT14 tape controller, performing TSV05 and Tape Mass Storage Control Protocol emulations.

The controllers conform with the revised Q-bus packaging used by DEC in the Microvax 3500 and 3600, according to the vendor.

Fill performance gap

Ron Browning, director of storage and communications product marketing at Emulex, claimed the controllers fill a performance gap. While DEC has increased the performance of Q-bus-based systems with the Microvax 3500 and 3600 models, it has not similarly enhanced its disk and tape offerings, according to Browning.

The QD34 and QD24 microprocessor-based disk controllers emulate DEC's Mass Storage Control Protocol. Incorporating Emulex's very large-scale integration logic, the controllers optimize the performance of the Microvax 3500 and 3600 systems through firmware and hardware, Emulex claimed.

The QD34 operates at a 3M byte/sec. disk transfer rate, allowing users to connect up to four SMD/E disk drives to the controller. By using the largest SMD/E disk drives available, one QD34 can provide 4G bytes of storage capacity, the vendor said.

The QD24 is intended for users requiring a small package. The QD24 supports up to four 5¼-in. ESDI disk drives with transfer rates up to 15M bit/sec. A QD24 can expand storage capacity to more than 2.4G bytes using the 760M-byte ESDI drives that are now on the market.

The QT14 is a microprocessor-based tape controller that connects a Pertec Computer Corp. streaming tape drive or a start-stop tape drive to a Microvax 3500 or 3600.

The QT14 supports a variety of typically used tape formats at speeds from 12.5 to 140 in./sec. The QT14 handles data transfer rates up to 1M byte/sec. and has a 64K-byte data buffer for efficient streaming operation, according to the vendor.

All of the controllers will be available early this summer, according to Emulex. The QD34 is priced at $2,495; the QD24 lists for $1,795; and the QT14 is priced at $1,395.

The controllers are also offered as part of subsystem configurations.

A typical subsystem configuration combines a QD34 controller with an 850M-byte Control Data Corp. 9720-850 disk drive.

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Security

CONTINUED FROM PAGE 69

APL account, Whipple said. Both DEC and IBM loaned the firm their proposed machines for several months so that Security APL's three programmers could prototype their applications on both computers.

The primary question on Whipple's mind was which architecture could best support his APL programs, he said. APL, which dates back to the 1960s, is a mathematically oriented language that allows complex equations to be stated in concise and elegant code. Whipple estimates that using APL allows him to reduce program lengths by 80%.

In bringing Whipple's APL application to the 9370, IBM had its five APL specialists in its Santa Teresa, Calif., software development facility write special calls to the 9370's VM Version 5.0 operating system. "They took us out to Santa Teresa," Whipple recalled.

Software solution found

Even so, Whipple was not initially satisfied with APL's performance on the 9370. Later additions to Security APL's custom code reduced several processing bottlenecks, and use of an IBM 4381 Model 14 speeded runtime, according to Whipple.

But the software additions were not made by IBM — they were made by a six-person Atlanta firm called Interprocess Systems, Inc.

Gordon Chamberlain, president of Interprocess, said his 11-year-old firm also installed a new file system that is more compatible with the VM operating system.

"What we do is to emulate the Decsystem facilities," Chamberlain said. "We provide similar functions under the IBM environments of VM/CMS and MVS/XA." Interprocess has handled similar conversions of APL applications from Decsystems to IBM mainframes, he said.

Security APL also bought a new IBM 3380 Model J disk drive with 2.5G bytes of memory, several IBM 3174 controllers and an IBM 7171 protocol converter.

The 4381 was installed last October, and the four Decsystem-20s are slated for removal this summer. A remnant of Security APL's DEC days will remain in the dozens of DEC VT100 terminals at the firm's client sites. These DEC terminals will continue to be supported by the 7171 protocol converter.

"IBM opens a whole new world for us," concluded Whipple, who has been programming in APL on a variety of systems since he was a teenager in the 1970s — and is not ready to stop.

Whipple said he is looking forward to exploring new horizons that VM will open up, including entry into the world of IBM's DB2 relational data base management system, IBM's SQL/DS query language and use of IBM's Interactive System Productivity Facility, a screen-formatting aid.

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Gibson

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makes them feel secure in thinking that a solution to tomorrow's needs is waiting in the wings.

On the contrary, few things aggravate customers more than a forced migration to another architecture. By eliminating that need, Silverlake will go far.

Bigger is easier

In computing, users almost always want more power. Has there ever been a user who wanted less? With the 9370, IBM has shown that it is harder to shrink a system than it is to expand it. Many mainframe applications were built for large systems with the assumption that their power would continue to increase.

> IN COMPUTING, users almost always want more power. Has there ever been a user who wanted less?

One industry observer commented that the 9370 reminded him of Detroit automobile companies trying to make small cars in the mid-1970s. They started with large cars and tried to make smaller versions of them, but it didn't work too well.

But IBM, far from being ungainly in the small systems market, is, remember, the most successful maker of microcomputers in the world and is highly successful in making small multiuser systems as well. Its problems had simply been growth limitations and cross-system incompatibilities. Silverlake is supposed to eliminate those problems.

It is too early to tell for certain, but the responses of users and developers who have glimpsed the issues involved in Silverlake migrations show that the trek probably won't present insurmountable obstacles.

Silverlake should fare differently from the 9370, because IBM will be taking two successful small and mid-range systems and adding more functionality and power.

Silverlake's success is not unconditionally guaranteed, but, from here, it seems to have the right pedigree. It is taking a proven path to success.

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An IBC multiuser business system with eight terminals and two monitors will sell for approximately $12,000.

Integrated Business Computers, 21621 Nordoff St., Chatsworth, Calif. 91311. 818-882-9007.

Processors

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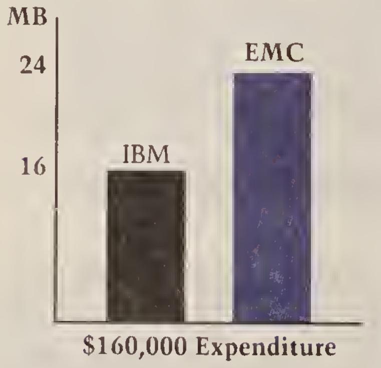

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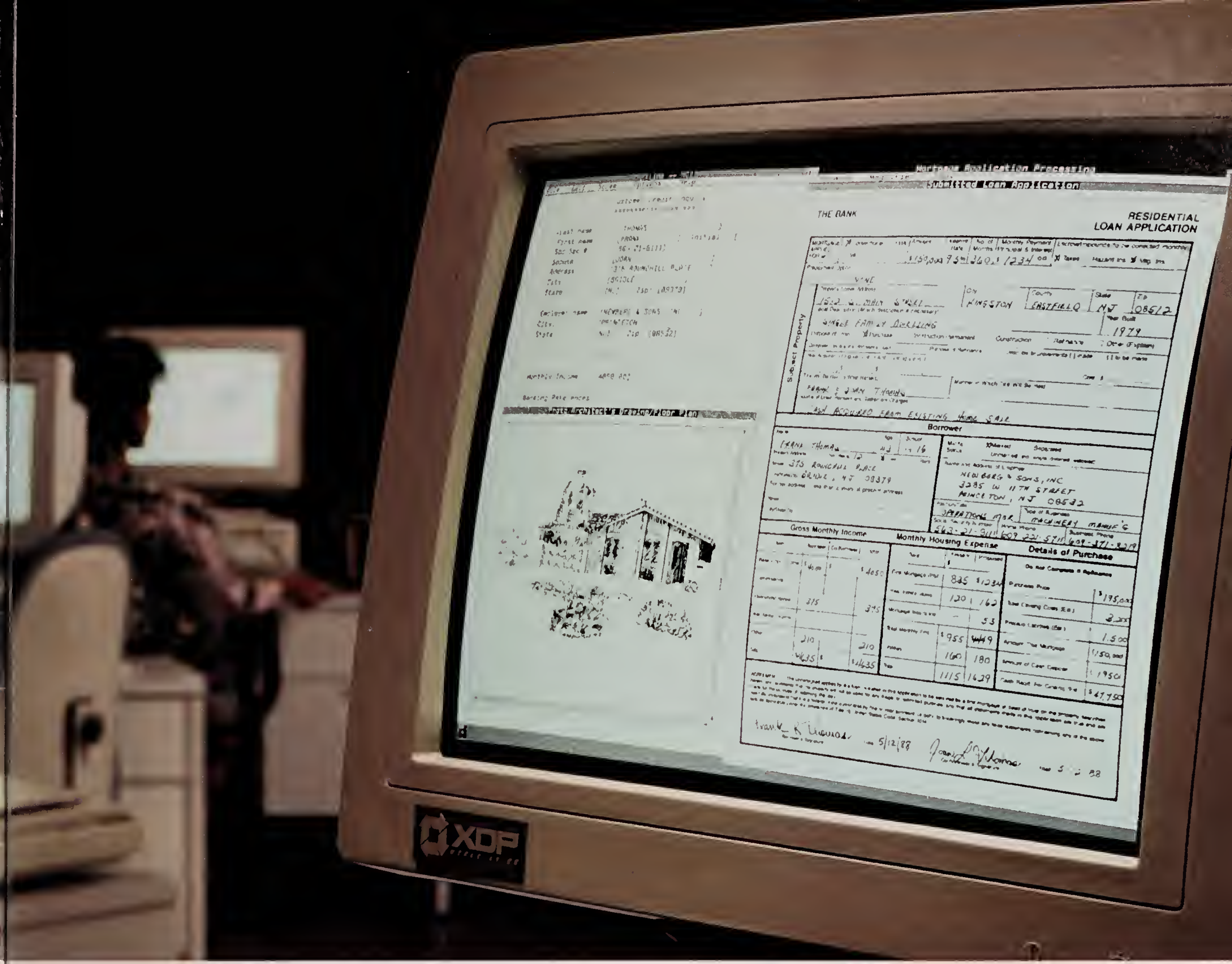
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EXECUTIVE REPORT

IBM/DEC INTEGRATION

Connecting DEC and IBM without ruffling feathers

BY GLENN RIFKIN

After more than 100 years of ringing America's doorbells, Avon Products, Inc., the $3 billion cosmetics giant, discovered that the cosmetics industry had grown mature and gone flat. A facelift was in order: diversify. By 1986, Avon had acquired the prestigious jeweler Tiffany & Co. and medical supply company Mallinckrout, and later sold both ventures and got into the home health care business, nursing homes, catalog clothing sales and retail cosmetics.

The diversification created a complex computing environment for Avon, which had grown used to an IBM batch processing world. The company, during the past dozen years, had brought in Digital Equipment Corp. machines for shipping and warehouse management, but the two environments had little need for interaction. According to Frank Giannantonio, Avon's director of corporate MIS, an order that came in through the IBM system would be teleprocessed to a DEC VAX in shipping, and the VAX would ensure that the order got processed and shipped within 24 hours.

Other than that connection, the DEC and IBM worlds were separate islands within the company. But that division of labor has changed dramatically. Avon restructured its MIS department in 1986, creating technical bridges between IBM and DEC.

STEVE DININNO

INSIDE

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IBM and DEC speak out — but not to each other
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Bridging the gap with a systems integrator
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The latest trend

Avon's DEC-IBM integration simply reflects the latest trend. The integration of both vendors is in various stages of implementation in other Fortune 1,000 companies around the country, and the task has raised many questions for MIS.

DEC's growth during the past decade has brought the Maynard, Mass.-based computer maker into a variety of Fortune 1,000 environments in which IBM has long been the master. As DEC's departmental VAX solution — a seamless connection across the entire product line — fueled stunning growth in the last three years, MIS managers began to hear a cry to tie DEC into the IBM mainframe in the data center. The IBM Personal Computer on the desk top also begged to be tied into this three-tiered model of host, departmental and desktop solutions.

For many MIS managers, the merging of the two environments opens a Pandora's box of issues:

- Are there clean, implementable, technical solutions to the integration question?
- Are there in-house experts available to address those technical questions or should a systems integrator be brought in?
- Both vendors claim a commitment to emerging Open Systems Interconnect (OSI) standards, but can a company afford to wait for both DEC and IBM to reach all seven layers of the model?
- In many cases, an interim solution to a connection problem has been implemented. Should companies now wait for OSI or put in a second interim solution?
- How do firms effectively merge the two very different cultures without ruffling feathers and losing good people?
- Should organizations stick primarily with DEC and IBM or work with third-party vendors for their solutions?
- How will the clamor over Unix affect everything a company is doing?

The list goes on, and MIS heads pound as users demand transparent hooks between DEC and IBM at a variety of levels. Most of all, hype must be separated from reality.

"Most companies have to take a very practical look at why they are integrating their data," says Irv Shapiro, president of Irv Shapiro & Associates, Ltd., a systems integrator in Skokie, Ill. "Not all data needs to be integrated, and not all data needs to be accessible from every terminal. There's a fine line between

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Rifkin is a *Computerworld* senior editor.

Connecting

FROM PAGE 83

need and desire. And MIS needs to make good, clear business decisions about when it is something you desire because you read about it and when it's something you need because it's going to help your organization. This puts MIS under enormous pressure," Shapiro adds.

The business need

At Avon, the business need for integration was clear. In 1982, Avon chose DEC's All-In-1 package for office automation, and DEC crossed over into the corporate side of the picture. When the company's changing business focus caused the 1986 restructuring, MIS became a corporate function with a small 17-member staff and responsibility for decentralized data centers in the company's divisions. Suddenly, what had been a heavily service-oriented function became a significant business function. The group started with a clean slate and a mission: to provide leadership, innovation and a business attitude to MIS.

In an unusual move, Avon chose DEC rather than IBM as its main vendor for the corporate MIS function. Running a stepped-up IBM system would have required more people than running a DEC shop, and Avon wanted to keep the group lean. Giannantonio saw that integrating the IBM and DEC worlds was essential to the plan's success.

Today, Avon uses DEC Vaxclusters tied together by thinwire Ethernet local-area networks, along with its IBM mainframes, to run the business. Corporatewide links were necessary to make the system work. In addition, Giannantonio is building an executive information system in corporate headquarters based on the VAX.

In order to link to the IBM world, Avon employed SNA Gateways from DEC and a bevy of third-party software offerings from Oracle Corp., Pilot Executive Software and others. Giannantonio was not intimidated by the task of integrating IBM and DEC technically. The harder task, he says, was to find the right people to run the show. "The staffing profile in a multivendor shop is different than in an all-Big Blue shop," Giannantonio says. Consulting skills were also paramount in order to make clear the corporate MIS mission.

Giannantonio realizes the complexities of the environment he has created. But he says it was a road well taken. Relying on more than one vendor increases flexibility, provides a wider range of computing solutions and develops a top-notch staff. "You come to appreciate the value of both vendors," he says. "The benefits far outweigh the risks."

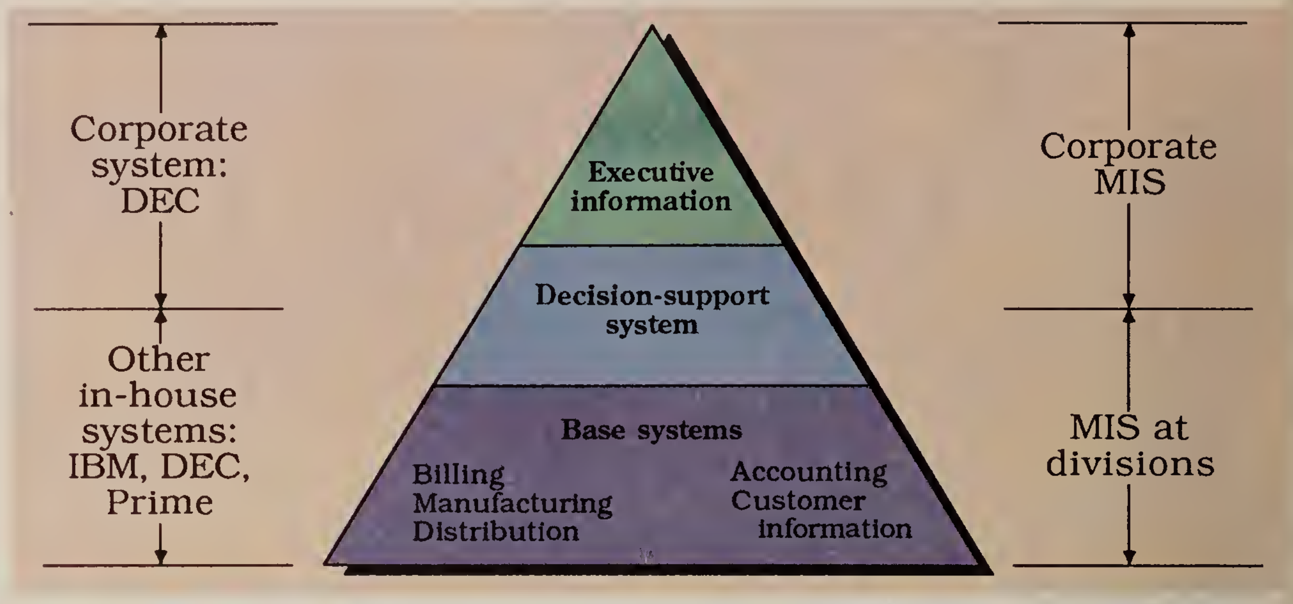
Who's on first?

As MIS wades into the integration waters, the risks become more apparent. Knowing whom to believe is the first risk. DEC claims it has been bringing out IBM interconnect tools for the past 20 years. IBM traditionally declined to participate in the interconnect game, believing itself to be the sun in the computing solar system and that it was up to the other planets to figure out ways to hook to it. But after a few years of tough times,

Continued on page 90

Multivendor computing at Avon

When Avon restructured its corporate MIS department in 1986, it chose DEC to provide the corporate system with a mandate to hook to all other in-house systems



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Walking the tightrope between DEC and IBM

BY MARTY GRUHN

If attempting to integrate hardware and software from one computer supplier is hazardous, integrating systems from two or more major suppliers is worthy of battle pay. This is the conclusion reached based on recent surveys conducted by The Sierra Group of more than 2,100 MIS companies regarding their computer-related purchasing plans and issues that will reach critical proportions this year.

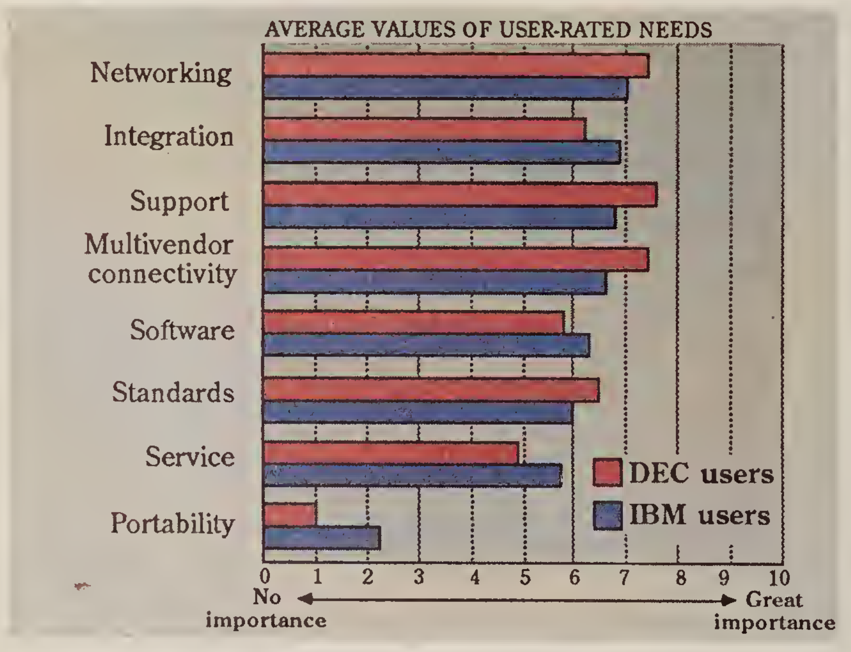
According to MIS managers, those attempting to interconnect systems from the industry's most prominent suppliers — IBM and Digital Equipment Corp. — face a doubly hard task. In these environments, MIS must balance between the short- and long-term agendas of two industry giants planning to do battle on the user's turf. MIS is challenged to interconnect a diverse range of systems and technologies that expands every month. Equally important, MIS must keep a watchful eye on the differing — and often conflicting — long-term directions of IBM and DEC.

Although the objectives of DEC and IBM users are strikingly similar when viewed as a whole (see chart below), companies that use equipment from both suppliers appear to have strikingly different priorities, if not unique problems and challenges. For these hardy pioneers, the challenge lies less in physically connecting DEC and IBM products than in making the systems useful to end users. Those on the battle lines report the following key issues and needs:

- **Improve after-installation support.** According to MIS managers who've been through it, interconnecting DEC and IBM systems places even more pressure on the quality and availability of after-sales support provided by all suppliers involved. The most commonly cited need was to improve the availability of personnel to answer technical questions.
- **Deliver systems more quickly.** Although delivery is a sore spot for most technology managers, this issue reaches critical proportions when companies attempt to interconnect large installed bases of systems. One user put it succinctly: "Real deliveries instead of vaporware and 18-month lead times." This desire was echoed by others who cited the need to improve responsiveness by delivering systems on a timely basis and meeting delivery commitments already made. Reading between the lines, the frustration of managers is clear. Long-term grandiose strategies may provide customers with a sense of the future, but glossy brochures do little to interconnect users.
- **Agree on standards.** While the catch phrase "industry standards" is in vogue, companies that interconnect DEC and IBM equipment appear to be less interested in whether or not these suppliers adhere to long-term evolutionary standards; they would appreciate it if both companies would agree on any deliverable standards at all.
- **Establish a common user interface.** Another hot issue is the common user interface. For those attempting to integrate IBM and DEC equipment, the need for a common interface represents a key component of their strategies to create a multivendor environment. While many would settle for DEC and IBM to each deliver an interface common to their own systems, many are looking beyond this toward interfaces that meld seamlessly with other vendors' interfaces.
- **Price software for real budgets.** Along with the battle cry for a common user interface comes the need for industry giants to price software so it can be purchased easily, preferably on a site or corporate basis. One MIS manager suggested the need for "site licenses — not site rip-offs." Others were more charitable in their quest for solutions to high software costs.
- **Solve the network management dilemma.** With the integration of multiple suppliers comes the problem of managing diverse networks and the desire to control this process through a single point. Most comments suggested vendors address network management issues in a multivendor environment rather than take the easier path of asking users to manage networks on a distributed basis. In fact, the need to improve networking was a common theme.
- **Quit fooling around with the personal computer.** Finally, a common theme of all users was the need for vendors to solve the incompatibility problems created by the advent of IBM's Personal System/2 and to make the integration of these systems a priority. While the disruptive effect of OS/2 and its derivatives on computing is obvious — one manager commented, "Quit fooling around with PC operating systems" — a more subtle, but equally important irritant surfaced: Incompatibilities between 3½- and 5¼-in. diskette drives are driving management and users crazy. •

What IBM and DEC users want

Despite different views of the world, DEC and IBM users have similar needs



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CW CHART

Gruhn is vice-president of The Sierra Group, a consulting firm based in Tempe, Ariz.

Speaking out on connectivity

Not in the same room . . . but on the same page

The DEC and IBM spokesmen declined to speak with each other, so interviews were conducted separately.

Michael Gayowski is one of the few people at Digital Equipment Corp. with IBM on his business card. He is the company's IBM interconnect marketing manager, based in Merrimack, N.H., and he recently spoke with Senior Editor Glenn Rifkin about DEC-IBM integration.

Three years ago, the line that fueled DEC's growth was "DEC hooks into IBM better than IBM does." Does that still hold true?
It's true, due to the fact that a lot of IBM's announcements have just been directional statements. So a lot of what end users are dealing with has really not changed from a product-set standpoint. There have been [IBM] product announcements that have been three years in deliverability. From the standpoint of connecting into IBM, Digital connects very well in terms of cross-product consistency, scaling and protection of investment in users' existing data processing equipment.

BRUCE GILFOY

DEC's Gayowski

From a personal computer integration standpoint, we can make IBM products full members of a Digital environment in which the PC goes through any of our transports and connects back into IBM through DOS VSE, MVS or VM. We have a consistent user interface as well as a consistent programming interface, plus the ability to have cross communications with other remote systems. Digital, in fact, takes it for granted. We probably need to articulate it more.

IBM has started to play up Systems Application Architecture [SAA] as an answer to what DEC has been doing. Will SAA blunt DEC's advantage?
Digital has an advantage in that we addressed this cross-product consistency years ago. We are now taking data processing into its next level of distributed processing. Users now have the opportunity of taking advantage of applications that are based on network resources, such as our Decnet Systems Services, which make the system the network. That's the next level. It all goes back to the basic philosophies when the companies introduced their architectures — [IBM's] was hierarchical; ours was peer-to-peer.

The sense is that IBM is starting to get its act together, and users are saying, "Maybe we'll wait and see." What is your reaction?
The product sets we have in place already offer the same functionality. If you look at it from the standpoint of the problems SAA is trying to address, they were never problems Digital had. There are not multiple architectures. There are no problems based on programming interfaces. Decnet is consistent across each of the packages. From the standpoint of the user interface, Digital has worked closely with X Windows out of MIT's Project Athena, and out of that is our superset that builds on top of X Windows, called DEC Windows. A lot of users are saying, "We need our competitive edge now, we need to maintain the edge in our industry today." They can't afford to wait and see. There's also a lot of proprietaryness wrapped in SAA.

But there is a lot that is proprietary about your solutions as well.
Yes, if you look at us up to Decnet Phase Four in 1982, that was the case. Decnet Phase Five is actually referred to as Decnet/OSI just to show that what we are going to be doing is not just building gateways to an Open Systems Interconnect [OSI] arena but making Decnet OSI-compliant. Right now, we are compliant to Layer Four, and we have a module that runs on Layer Seven that we call X.400 mail services.

Last month, Ken Olsen shared a stage with John Akers and other industry leaders creating a controversial challenge on the Unix issue. How does that fit into your message?
Within a Decnet environment, we have Decnet Ultrix, which allows an Ultrix system on a local-area network to take advantage of resources that the LAN has. Off the LAN, we have VAX systems and Microvaxes, and we also have Ultrix systems. As our users start requesting more and more services to be built onto the Ultrix platform, we are constantly aware of what our customers' needs are. If that need should actually force us to bring additional access routines, they will have that same level of opportunity.

Does this interest in Unix potentially negate your advantage?
What separates the vendors is the added value they bring to a network.

What about users in other environments?
There are a lot of environments that use TCP/IP. End users do ask, "Should I develop my applications for an interim step or should I plan for OSI?" That's the question. Because in some environments they are saying, "I don't want to

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Bob Anderson is manager of telecommunications software product management in IBM's U.S. marketing and services group, based in White Plains, N.Y. Anderson recently spoke with Senior Editor Glenn Rifkin about IBM's view of the world of IBM-DEC integration. Anderson declined to speak specifically about Digital Equipment Corp. but addressed IBM's views of a multivendor environment in general.

In sites where IBM equipment coexists with DEC, what requirements are you hearing most from your customers in terms of connectivity?
We regard multivendor connectivity as one of our top customer requirements. That has a number of facets, depending on the particular application. We've announced and made available Transmission Control Protocol/Internet Protocol [TCP/IP] with VM, and I expect there will be additional requirements for expanded support for TCP/IP. We have a product called the 8232 protocol converter that provides that kind of support for TCP/IP for Ethernet connections.

We also have a formal marketing arrangement — IMAP [Industry Marketing Assistance Program] — and relationships with several companies from the outside that have fairly intensive offerings in the area of multivendor connectivity.

What that means is our marketing teams, when a customer comes to them with a problem with multivendor connectivity, if necessary can call these folks in and work with them on the customer's problem.

Is there some sense, though, that for these customers, third-party solutions tend to be interim solutions and the customers are looking more for standards?
Absolutely. There is a great deal of hope and excitement on a lot of our customers' parts for the promise Open Systems Interconnect [OSI] brings as a standard way of connecting a variety of vendors' products together. OSI is clearly IBM's strategic direction for interoperability among our systems and others. However, the rollout of products in that area across all the vendors will take time.

We have customers who have connectivity problems today. For those people, a TCP/IP solution, an IMAP solution and an IBM product like the 8232 or the 3708 protocol converter are solutions available today.

For the customer who can afford to wait for the availability of the strategic solutions of the future, OSI is certainly the direction IBM is taking.

Your enthusiasm for OSI somewhat surprises me, since some people in the industry think IBM is lukewarm on OSI and it's not going to happen anytime soon.
We have made and are making substantial investments in OSI. We have several products announced and available in Europe; we have had several different demonstrations with other vendors at the Hannover Industrial Faire and the Enterprise Networking Event this month — we were a part of an extended interoperability demonstration at that event. Frankly, the demand for our product in the U.S. has not been as great as in Europe. I should say that we're seeing that demand increasing, and we intend to respond to that.

Is that X.400, for example?
X.400 is the predominant one.

That is not being sold in the U.S. today?
No.

When will that be sold here, do you think?
I really don't want to comment on our product plans, but we plan to have OSI solutions available in a timely manner. When the demand is sufficient, we'll bring it to the U.S. marketplace.

BRUCE GILFOY

IBM's Anderson

IBM is extremely committed to Systems Network Architecture [SNA]. How does this fit in with the OSI direction?
There are two points that I think are important to make. The first one is in the area of multivendor connectivity. We have opened up over a period of years many of our SNA architectural connection points — LU6.2, PU2.1 being the obvious examples — and many vendors have responded to that. There are in excess of 20 vendors in the U.S. today that have, for example, announced support for LU6.2. We also provide a test facility where a vendor or customer who is implementing connectivity into our systems using LU6.2 can test their systems against the same set of tests we use internally for our product.

The second part of that is the position of SNA and our OSI plans. OSI will be the strategic vehicle we will settle on for multivendor connectivity. SNA will continue to be the connectivity solution of choice for communications among IBM systems.

DEC has offered several key products in terms of SNA gate-

Continued on page 89

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DEC

CONTINUED FROM PAGE 85

go with a proprietary architecture, I don't want to write all my applications under an SNA or SAA umbrella. Presentation services should be done by X Windows or an international standard at the presentation layer, not built around a proprietary architecture that reflects a hardware investment in order to maintain that user interface. Right now, users need to be reaffirmed that OSI is real, and OSI is here.

When you talk to customers, what type of integration are they asking for the most?
From an IBM interconnect standpoint, they were looking for connectivity back in '82. We had built our IBM Decnet/SNA Gateway, and we did offer them terminal emulation. As we moved further, in 1984 came the support of IBM's Disoss. Digital was the first vendor to add the next level, which we referred to as interoperability; the ability to access information reliably from another environment.

So somebody, for example, in a DEC All-In-1 environment can create a word processing document, send that document over to the IBM mainframe where it then becomes the network that provides the translations from Digital's format into IBM's format, which is Document Content Architecture. It also handles the rules and regulations to get it up there, which IBM refers to as LU6.2.

And IBM offers nothing for DEC users in that vein?
Right. They rely on third parties. Maybe that will change.

What about electronic mail?
Our recent Mailbus offering allows for mail to [originate] on a Digital machine within multiple IBM environments without end users on any of the other systems having to relearn another mail environment.

What are you finding that customers want, their big need, that you have not yet provided?
A lot of our end users would like to stop making DP decisions on nonstandard networking topologies. A lot of companies are in business, not for purchasing DP equipment but for meeting their own bottom line. The bottom line has been the focus of this last economic turn since back in October. They've really focused their DP budgets to be more cognizant of what is being spent. So we are being asked continually to look at nonstrategic IBM interconnect solutions, where IBM has stated that they would not be taking that product set into SAA. And then users ask us to provide solutions for that market segment.

What about DEC's lack of a PC? Why does that keep coming up?
In most business decisions, sometimes you are asked to have a single vendor for total DP needs. It's in the area of PCs that users are still asking Digital to provide that added value, taking a PC platform and making it a Digital-supplied product. As the end user looks at requests of workstation platforms, especially where added value is dependent on the uniqueness of that workstation, there will be users who will request that that device take advantage of Digital's networking philosophy or OSI migration.

Is this where the third parties will be able to thrive?
Yes. From the standpoint of workstation connectivity, third parties will be able to offer solutions outside of what Digital offers today. Workstation connectivity is very strong from a Digital into an IBM host side. Coming from the IBM side back onto the VAX side is where people want more solutions.

One suggestion about how to deal with IBM-DEC integration is get an IBM sales representative and a DEC sales rep in the same room and work this out together. Is DEC willing to sit in a room with IBM and an MIS manager?
I've never been in an environment where they brought both players to the table at the same time. I would have no fear of trying to sit down and work with a DP firm based on a multivendor environment. I've got the battle wounds of trying to address a multivendor environment.

The bloom seems to be falling off the rose for DEC, especially now that IBM seems to be coming around saying, "We didn't do it right the first time, but we're going to do it right now." What's your biggest challenge?
I don't think the petals have fallen off the rose. We don't have to make any architectural changes to polish that rose. Everything has been put in place today to allow us to grow into an enterprise network and be an enterprise network provider. But how are we going to polish up the rose and make Digital shine again? From a hardware architecture standpoint and from VMS, we've been doing very well. I don't think that portion of Digital needs to be shined. From the standpoint of internetworking communications, we told the world at Decworld last September that we would be taking out the proprietary architecture and opening it up and making it nonproprietary. From the standpoint of IBM interconnection, we are constantly providing the services and needs that our end users have been requesting, and in the next round, it will be in the area of transports. We will be providing faster and higher throughput connections. ●

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IBM

FROM PAGE 85

ways and commitments to LU6.2 and PU2.1 to try to bridge that gap. Has IBM done anything to go in the other direction specifically in that way?
The 8232 protocol converter and our 9370 support for Ethernet are certainly a couple of key examples of places where we've offered that kind of support. We have — and some people don't notice it — a very extensive array of X.25 support in our product line. Most of our products have native X.25 adapters available on them.

We offer for our SNA network two important products — the Network Packet-Switching Interface, which allows an SNA application to use an X.25 network for communications or to deal with an X.25 DCE on the other end of the connection. We also offer a product that is well accepted and very exciting to our customers, and that's the SNA X.25 interconnect product, which we announced the program product version of in January.

This product will allow our customers to use their SNA networks as a backbone for X.25. For instance, a customer could take a network of other vendors' equipment that supports X.25 today, run that on an IBM SNA backbone network that they've invested in and support and manage that under the control of Netview, our network management tool.

One of the things DEC has been making a nice living off of in the last few years is the claim that they hook into IBM better than IBM does. Do you have a response to customers who ask about that?
First off, I want to say categorically that no one connects to IBM better than IBM does. Second, I believe that we have a range of multivendor connectivity offerings available for our customers that are as rich as anyone in the industry.

Can you elaborate on that?
We have integration capability with our complex systems group, and we will go in and look at and work with the customer and with other vendors on any particular connectivity problems when necessary.

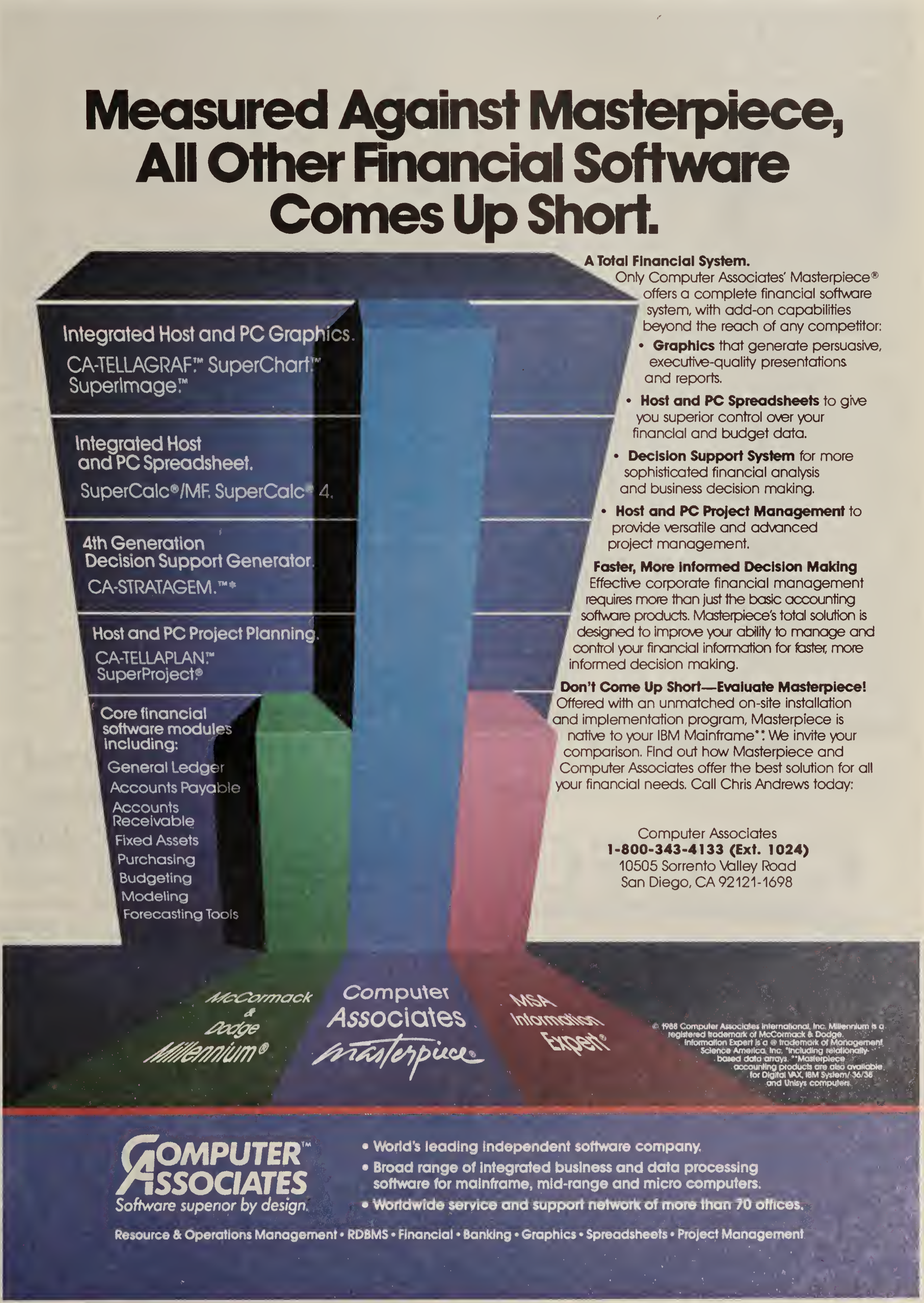
We have, to support our sales force, a connectivity lab in Raleigh, N.C., where if there is a particular situation where they need to test out or demonstrate that a certain type of connectivity with those products works, that helps us solve the customer's problem.

How will Systems Application Architecture (SAA) fit in all of this?
SAA will certainly need to deal with the multivendor environment.

Doesn't this add another level of confusion for the customer?
The requirements for SAA in the area of multivendor connectivity are also being considered.

At a recent conference, a customer said, "DEC is easy to get out of but hard to get into; IBM is easy to get into but hard to get out of." How do you respond to that?
As evidenced by a number of the product offerings I've covered with you, we are working very hard to solve customer problems of connecting our systems to others. Today we have a very healthy array of solutions, and I expect you will see us continue to focus on that.

TCP/IP is a 20-year-old technology. Does it surprise you that it retains this popularity and that IBM is relying on it so heavily at this point?
The reason we're responding to our customers in the area of TCP/IP is that the long-term strategic solution, OSI, is still a ways away. TCP/IP has a very wide following in government and the academic community, and we're seeing increasing interest in it from those customers who need solutions today in the commercial environment. That's the reason we're responding in that area. •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Connecting

FROM PAGE 84

brought on principally by DEC's success in hooking into IBM and offering a cohesive architecture, IBM has softened a bit.

While DEC pushes hard toward OSI standards, IBM moves more slowly in that direction. It is content to retain and build on its Systems Network Architecture (SNA) model and add such wrinkles as Systems Application Architecture (SAA) and OS/2 to the picture. Competitors have no choice but to find ways into the IBM universe via open standards interconnects, proprietary connections and third-party software offerings.

Chemical Bank's Baer

Adding to the confusion is the presence of Transmission Control Protocol/Internet Protocol (TCP/IP), the protocol from the U.S. Department of Defense that connects an estimated 20,000 computers at government research laboratories and universities throughout the U.S. and encompasses thousands of networks here and abroad. This connection protocol is growing in popularity as the wait for OSI continues, and IBM has put its imprimatur on TCP/IP as an interim solution, according to Bob Anderson, manager of telecommunications software product management in IBM's U.S. marketing and services group.

Integrating DEC and IBM environments, therefore, is a complex problem. Connections can be made on a variety of levels, depending on the user need and application desired, but a fully integrated, seamless melding of the two environments is virtually unattainable except by the most sophisticated and well-financed companies.

For example . . .

Du Pont Co. in Wilmington, Del., and Chemical Bank in New York have implemented innovative and successful integration plans. Jay Wertman, an MIS senior specialist at Du Pont's Charlotte, N.C., facility, explains that the company has an electronic mail network that hooks together more than 30,000 DEC users and 12,000 IBM Professional Office System (Profs) users in Du Pont facilities nationwide.

With the second largest Decnet network — only DEC itself has a larger one — Du Pont has furnished E-mail interconnects using third-party offerings from Joiner Associates, Inc., Interlink Computer Sciences, Inc. and Soft-Switch, Inc. The company also worked closely with DEC to create the network. "It's very seamless. A Profs user addresses a DEC user exactly as if it were a Profs user," Wertman says. The system, however, was costly and technically difficult to install, requiring a lot of homegrown code to customize the connections. Du Pont has also used DEC's Decnet/SNA Gateway product to support terminal emulation sessions going from VAX to IBM applications running under CICS, TSO and IMS.

Chemical Bank's Rosemary Verrechio Baer, vice-president of on-line systems planning, points out that the retail side of the bank has a large DEC-to-IBM interconnect project under way in which two Ethernet networks are clustered with two VAX 8550s to create a single LAN with 400 intelligent workstations hooked into it. "As far as LAN interconnects to IBM environments are concerned, we probably have one of the largest, if not the largest, in the marketplace," Baer says.

The VAXs are running datastream code that maintains LU2 3270-type sessions going out through gateways into the IBM environment. The unique aspect of this setup is that users at the workstations do not have to flip out of the mode of intelligent workstation and into a dumb terminal mode to acquire IBM-based data. To the user, it is irrelevent whether the data is on the workstation, LAN or host.

Baer says the design and development was done with DEC's help and New Software Corp.'s Prism software. "It's a matter of creating a management environment that allows you to proceed," Baer says. Chemical's forays into DEC-to-IBM connections "have given us a technological growth platform that is fairly unlimited and puts us about three to five years ahead of other people in the industry."

But not every MIS shop is given the support for such ambitious projects. And many who have tried question the feasibility and necessity for transparency. "The most common trend is that people want the integration to be completely transparent to end users, and they are surprised to find the tools aren't there yet," Shapiro says. "This is a nontrivial technical problem."

"The whole business of transparency and seamlessness is garbage," adds Frank Dzubeck, president of Communications Network Architects, a consulting firm in Washington, D.C. "I've never seen one that is 100% clean. There's always a ripple someplace you've got to take care of."

The integration problem has received various treatments, depending on the corporate environment. In most shops, according to Larry DeBoever, president of DeBoever & Associates, Inc. in Acton, Mass., "It is an accomplishment just to get MIS to agree to put VAXs and IBM in the same room."

Traditional IBM MIS shops are not thrilled with the DEC

Stacking up against OSI

The future version of DEC's Digital Network Architecture, currently complete through Level 4, will adhere more closely to the ISO's OSI model than does DNA Phase IV or IBM's SNA

Systems Network Architecture	Open Systems Interconnect	DNA Phase IV	DNA/OSI Phase V	
End user	7. Application layer	User	• Networked office systems • Videotex • Electronic mail • Computer conferencing • Remote data base • File transfer • Virtual terminal • Network management • SNA interconnection • Decnet system services	• OSI FTAM • CCITT X.400
		Network management		
Presentation services	6. Presentation layer	Network application		OSI presentation
Data flow control	5. Session layer	Session control	Decnet session control	OSI session
Transmission control				
Path control	4. Transport layer	End communication (Decnet transport)	Common transport interface	
			Decnet transport	OSI transport
	3. Network layer	Decnet routing	• ISO connectionless service • ISO connection-oriented service (over CCITT X.25) • ISO routing protocol	
Data link control	2. Data link layer	Data link	• Data link • CCITT X.25 • OSI-standard Ethernet • Digital Data Communications Message Protocol	
Physical control	1. Physical layer	Physical link		

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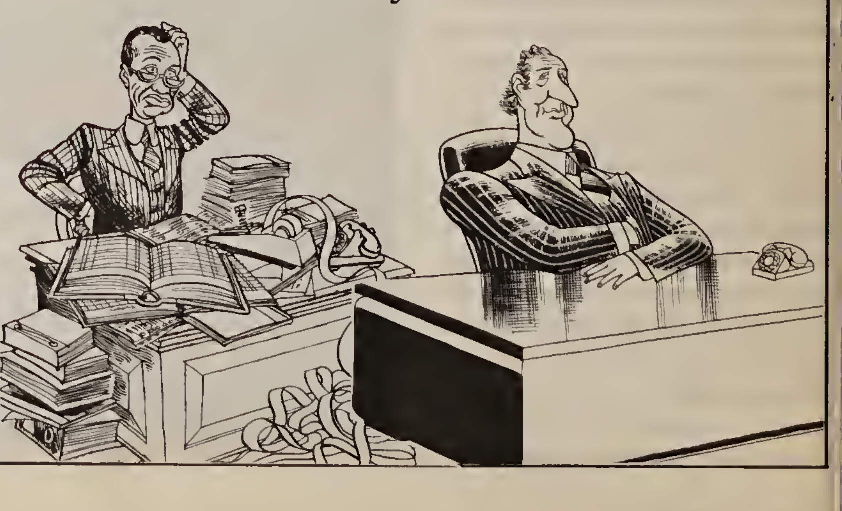

> "A CUSTOMER ONCE told me that both sides — DEC and IBM systems professionals — are like different sects of Shi'ite Muslims. They are each convinced they are right and don't want to talk about it."
>
> LARRY DEBOEVER
> DEBOEVER & ASSOCIATES, INC.

insurgence, and this clash of cultures is among the biggest obstacles to the successful integration of the two vendors. DeBoever describes what a customer once told him: "Both sides — DEC and IBM systems professionals — are like different sects of Shi'ite Muslims. They are each convinced they are right and don't want to talk about it."

Avon's Giannantonio points out that the professional biases run deep. During Avon's move to DEC in the corporate MIS department, a top systems software programmer came to Giannantonio asking for a change of venue so he could stop a two-hour daily commute to Avon's Rye, N.Y., data center. "We'd love to have you," Giannantonio told him. "But you'll need to learn the DEC system."

"No way," the programmer replied. "I don't want to lose my technical edge."

More daring MIS professionals are embracing rather than rejecting the new challenge. Those who master both DEC and IBM possess extremely valuable resumes, according to systems integrators.

Like beauty, integration is often in the eye of the beholder. There are, according to DeBoever, nine levels of DEC-IBM integration that an MIS shop needs to consider, ranging from the mundane to the nearly impossible. In a recent survey of MIS managers and third-party suppliers, DeBoever found that the following requirements must be met to fulfill true and total integration:

Communications Network's Dzubeck

- Cross-system terminal access — VAX to IBM. The most common form of DEC-IBM connections.
- Cross-system terminal access — IBM to DEC. Only a few shops are doing this kind of integration, simply because there are only a few tools available.
- File transfer between systems. DEC offers Decnet-DOS access from IBM PCs into a Decnet network. Third-party offerings are also available.
- High-speed bulk file transfer. For those with serious throughput needs, basic file transfer is not adequate, so there is urgency for this requirement today.
- Data base extraction and subset transfer. DeBoever predicts this to be a hot topic in 1989. Currently, there are few tools available to allow for data base extraction and transfer.
- Distributed data base management. Few shops are doing this now. Oracle, Relational Technology, Inc. and Cullinet Software, Inc. — at the VAX level — have products in this area, and more are coming.
- Peripheral device sharing. Users say, "I don't want to buy DEC storage devices, I want to access my IBM disk drive from my VAX."
- E-mail and document interchange. The requirement with the highest urgency among those surveyed. "This is user-driven," DeBoever says. DEC is committed to the OSI X.400 standard in the long run. IBM is only selling X.400 in Europe, claiming there is not enough demand in the U.S.
- Distributed application development. There aren't many options in this area; TCP is the only reliable option now.

Even the most sophisticated MIS shops have not solved all of the integration requirements as of yet. And those that have done the most have utilized a variety of solutions from different sources. Third-party vendors align themselves like pilot fish to the big whales through Cooperative Marketing Partner agreements with DEC and Industry Marketing Assistance Program agreements with IBM.

Joiner Associates provides software for network job-entry applications between DEC and IBM environments. "We find our business coming from existing standalone systems and, more frequently, existing networks where these networks have just been passing like ships in the night. But those networks are growing bigger and thus colliding, and all of a sudden, consciousness is raised that they need to be attached together," says Stephen Arnold, Joiner's product manager.

In the long run, many users prefer the uncomplicated life of dealing with as few vendors as possible. "We've used third-party products when nothing else was available, but our preferred route is to use the primary vendor's product," says one MIS manager at a large corporate shop. "As DEC and IBM bring out products that suit our needs, we will convert to them."

For most MIS shops facing the question of how to tie DEC and IBM together, the task is to puzzle out whether a custom solution with the help of outside consultants, third-party suppliers and systems

Continued on page 94

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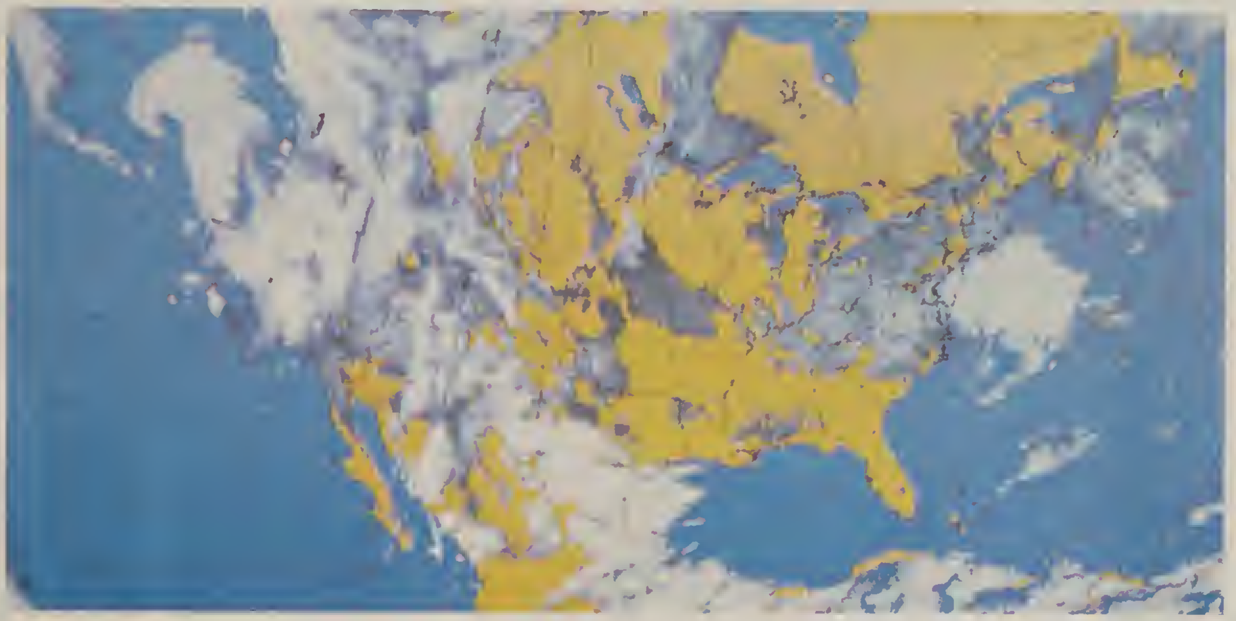

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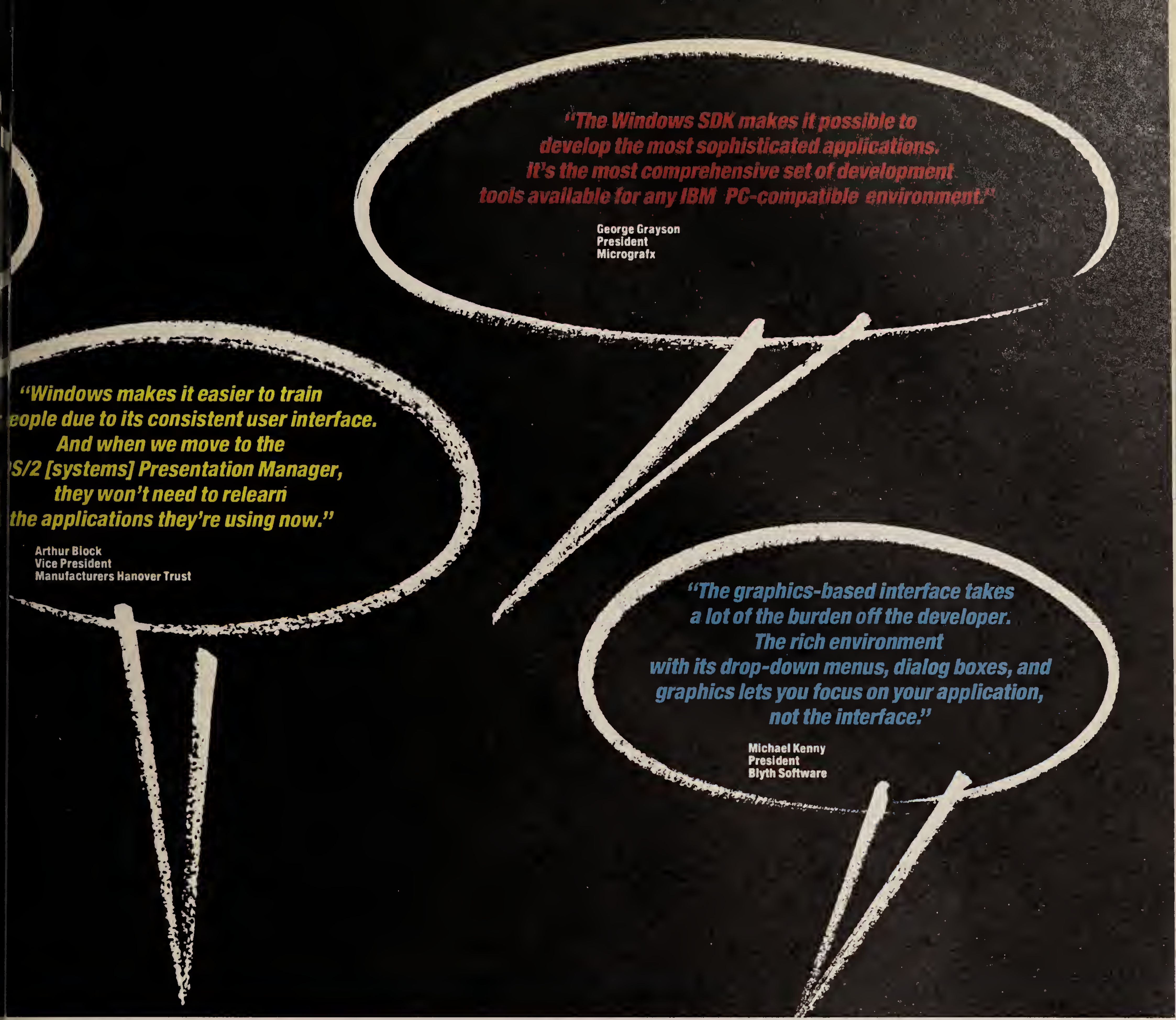

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Connecting

CONTINUED FROM PAGE 91

integrators is worth the high price. Or is it better to wait for DEC and IBM to come to some standards agreements?

The answer to the latter question is an unequivocal no in MIS shops that are being pushed today to provide a competitive edge for the company. Waiting for an unknown development in an unstated time frame by an industry as volatile and competitive as computing is tantamount to a death wish. MIS shops watch in wonder as the leading vendors cry for standards and then seemingly do everything possible to obstruct them. The recent confrontation between warring Unix factions — AT&T-Sun Microsystems, Inc. vs. IBM-DEC-Hewlett-Packard Co. and others — illustrates the distance between marketing hype and reality in the reach for standards. IBM prefers to acknowledge TCP/IP, though that support is lukewarm, according to analysts. DEC is not anxious to support TCP/IP, preferring to go directly to OSI. The MIS manager can only scratch his head and wait.

Adding to the confusion is the sheer size and power of IBM in this scenario. For instance, IBM announced its SAA plan last year as a common application protocol for IBM products to talk over networks, and suddenly the rest of the industry had to stop and take notice of the implications of SAA. Under the architecture, IBM hopes to deliver a common communications facility, user-access method, programming interface and a set of common applications across three strategic processor families.

This influence makes it difficult for other vendors and MIS managers to commit to certain standards. Until IBM embraces a concept, it barely breathes.

"IBM talks a lot about OSI and then implements their SNA proprietary architecture," consultant Shapiro says. "It will be a long time before you see real OSI functionality from IBM. DEC is aggressively pursuing OSI, but there's a lot of code to be written. It's a good two years away in the DEC space also.

"What people fail to realize in the integration process is that data communica-

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Third-party market

Dozens of third-party hardware and software vendors have jumped into the DEC-IBM integration market with a variety of offerings. The following is a sample of the many companies and their products:

New Software Corp., North Attleboro, Mass.: Prism, software applications package that controls the integration of data elements or work units between Digital Equipment Corp. and IBM.

Joiner Associates, Inc., Madison, Wis.: Jnet, software package that provides network job-entry system creating links from DEC's VAX into IBM.

Mitek Systems Corp., Carrollton, Texas: Product group that allows IBM to communicate with DEC and other vendors via an Ethernet or Decnet Transmission Control Protocol/Internet Protocol (TCP/IP) network.

Informix Software, Inc., Menlo Park, Calif.: Decnet-DOS, relational data base management system product for hooking IBM Personal Computers to the VAX.

Interlink Computer Sciences, Inc., Fremont, Calif.: Variety of VAX-to-IBM communications packages, including a DEC Microvax-based channel-attached gateway linking IBM mainframes and Decnet networks.

DB/Access, Inc., Cupertino, Calif.: Access/Star, an integrated, multivendor distributed data extract and delivery system for end users and application developers.

Communications Research Group, Inc., Baton Rouge, La.: Blast, a file-transfer software link that uses standard dial-up phones and networks. Provides data transfer using a Synchronous Data Link Control-like full-duplex protocol.

Flexlink International Corp., Renton, Wash.: Flexlink, software that links dissimilar operating systems and computers using a variety of I/O interconnect hardware.

Advanced Computer Communications, Santa Barbara, Calif.: Access/MVS, implements the TCP/IP protocol suite for IBM mainframes, allowing VAX-to-IBM connectivity.

Soft-Switch, Inc., Wayne, Pa.: Offers distributed gateway software for transparent interconnection of multivendor electronic mail systems.

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Connecting

CONTINUING FROM PAGE 94

tions is a very small piece of it," he adds. "Data integration is a bigger piece, and that causes a lot of problems."

And while DEC may be more innovative in providing links to IBM than virtually any other major vendor, it is not operating in an altruistic mode either. Ken Olsen's open criticism of such standards attempts as Manufacturing Automation Protocol and Unix makes it clear that DEC hopes to perpetuate its proprietary VAX/VMS world as long as it can.

Unlike IBM, which can let the world beat a path to its door, DEC recognized early on that connecting to IBM was critical. According to an International Data Corp. report on DEC networking, "The DEC game plan is to provide the industry's best IBM interconnection in an attempt to bait customers [if not already hooked] into the Decnet hemisphere. DEC is confident that if its Decnet networking implementation is laid side by side next to IBM's SNA, in the long run customers will eventually migrate to DEC."

UNLIKE IBM, which can let the world beat a path to its door, DEC recognized early on that connecting to IBM was critical.

The key offering from DEC in this regard is its Decnet/SNA Gateway, unveiled in 1982. Decnet/SNA is an Ethernet-based software and hardware solution that allows Decnet users to exchange information with users and applications on SNA-based systems. It is a network-to-network product as opposed to a single-function emulation between computers.

Gateways from DEC and third parties provide links between DEC's Digital Network Architecture into SNA, but gateways between protocols are not the true test; gateways between applications are crucial. Vendors are addressing this issue, but as the applications become more complex, the links are more difficult to achieve. For example, as OSI matures in the next few years, the integration of the mini and micro worlds will become relatively easy. But the mini- and micro-to-mainframe world is a tougher nut to crack and will, according to Shapiro, be gateway driven for "a long, long time."

Possible side effects

Consultants such as Dzubeck point out the drawbacks of gateways. He says he believes the key issue in DEC-IBM integration is throughput and that any approach requiring a Decnet-to-SNA gateway is "architectural disembowelment."

"What happens is that in the process of tearing things apart and then putting them back together, you get throughput degradation — in the first implementation of the Decnet/SNA Gateway, you actually had a ratio that the best you could get out of a 56K-byte line was 9.6K bytes on the other side. That's pretty sad," he says. Dzubeck points out that one antidote to the problem is putting channel connections on the IBM mainframe itself, but a lot of users are hesitant to put foreign devices on an IBM channel.

"The issue for the user is the different implementation approaches," Shapiro explains. "Somebody familiar with programming in an IBM network environment has a significantly different thought process than someone doing programming in a DEC environment. Therefore, when we go to integrate these two environments, we have to integrate the hardware, the software and the people. And it's integrating the people that sometimes is as complex as anything else."

For example, in an IBM environment today, it is very difficult to do program-to-program communications over the network. Yet, it is relatively easy to implement very restrictive security systems for terminal access. In the DEC world, conversely, it is easy to do program-to-program communications, but securing the network is more difficult, Shapiro says. Thus, trade-offs are necessary. DEC users typically take a lot for granted and are perplexed at the complexity of the IBM environment.

"DEC users think that it is too much work. 'Why should I have to regen my front end just to add another line?' they ask. The IBM person tells the DEC person, 'I'll schedule that for you next month.' The DEC person gets frustrated, and the IBM person can't understand the impertinence. And you have continued friction," Shapiro says.

Because of tradition, many companies have kept the DEC and IBM environments separated. When integration is initiated, often at the behest of end users, the two factions frequently are left to hash it out themselves. But the two serfdoms have no predisposition to cooperate; there has usually been little cross traffic between environments.

In the long run, cooperation is inevitable, whether willing or forced, simply because end users are demanding it and MIS is under the gun to produce. Large users such as Du Pont have realized the inevitability of the merging of the two worlds. "Among the Du Pont MIS people, there is widespread acceptance of DEC as a major player," Wertman says. "I can't speak for the IBM sales reps, but the Du Pont-IBM people are providing a great deal of cooperation. They know DEC is not going away." •

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Systems integrators help bridge gap

Successful IBM-DEC integration efforts require that somebody be put in charge, a communicator from within MIS who can negotiate a lasting peace. But often, because of the wall between the Digital Equipment Corp. and IBM camps, an outside consultant or systems integrator is also required.

"You bridge the gap by being a good negotiator, by listening to both sides, by understanding their positions and by translating them," says Irv Shapiro, a systems integrator and president of Irv Shapiro & Associates, Ltd. in Skokie, Ill. "In essence, you are like a simultaneous translator working in the United Nations. As a systems integrator, your technical skills are important, but your communications skills are more important."

Systems integrators bring an objectivity to the complex DEC-IBM integration issue that is often impossible to achieve by MIS and departmental groups.

Going this route is mandated in many cases because companies simply are not willing to wait for DEC and IBM to come together in a world of open standards. And third-party vendors do not often have the resources to provide full support.

"Companies are not waiting. They've got requirements to meet today," says James Bernstein, a consultant at Arthur Andersen & Co. in Los Angeles. "Until all seven layers of OSI are fully functional, you are going to have to do some programming to support the communications. There's no way around it."

According to Bernstein, systems integrators do not come cheap. Large-scale implementation of DEC and IBM connections can cost into the millions of dollars.

But a systems integrator can address three key aspects of the job — an ability that is sometimes lacking in-house.

"You need to develop your application," Bernstein says, "which requires a knowledge of the business, the operating environment and the business problems you want information technology to address. Then, you've got to have people who understand the OSI and MAP protocols to develop a communications environment to support the user requirements. And third, you need the project management expertise. You can't just hire different groups to solve the different problems; you need someone who is full service, someone who can provide all the skills to make it happen," he adds.

Arthur Andersen's Bernstein

Patrick Farrell, senior principal at American Management Systems, Inc., a systems integrator in Arlington, Va., adds, "You must intelligently pick the right tools, get the right suite of products, because they are not as all-encompassing as people expect. And you have to decide who is primary and who is secondary when you are setting up an LU6.2 link. And that becomes a political issue because of SNA's tradition of 'I'm the mainframe, and you're not.' "

Consultants agree that the issues seem to be getting more, not less, complex. The return on investment for a systems integrator lies in the simple fact that he cuts down the risk. But Shapiro points out that for a project to succeed, the company must assume a visible stance.

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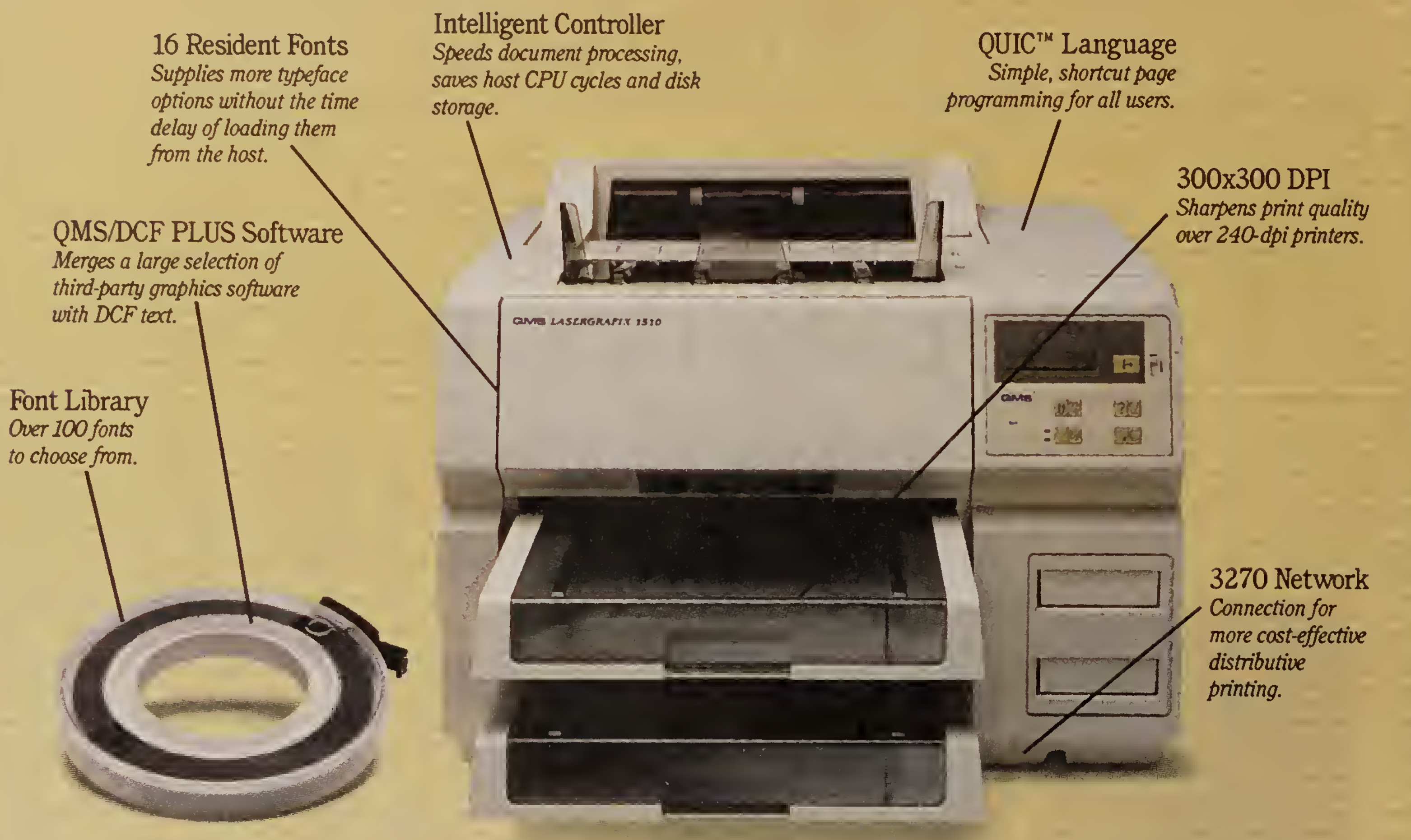

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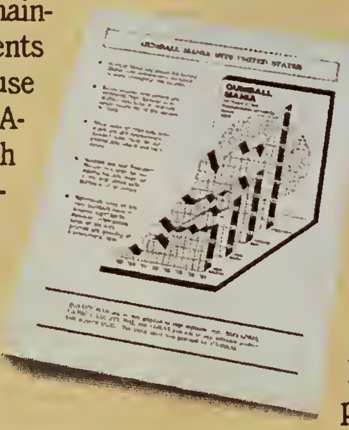

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SQL: Bane or boon?

The time to make the standard fit is now — before it gets too well established

BANE

BY JON ROLAND

Much has been said in favor of SQL and so-called relational data base systems. There has been some mention of resistance to SQL as a standard, but this has usually been dismissed as stubborn devotion to older, less advanced approaches to data base management.

But in fact, most such resistance comes from those who regard Structured Query Language as primitive, inadequate and poorly designed. I contend that SQL is a YABDIP — yet-another-brain-damaged-IBM-product — that must be rejected before it becomes too well established.

Many of SQL's advocates acknowledge its shortcomings but argue that support from IBM has made it the standard, whether we like it or not. They say we must, therefore, acquiesce and learn to make the best of it, just as we have with the Qwerty keyboard and such IBM gems as PC-DOS, the PCjr, Series/1 computers and EBCDIC.

But contrary to the mainframe mentality of many of its proponents, SQL is less established as a standard than Ashton-Tate Corp.'s Dbase is, as many will discover when mainframe programming ranks are filled by people who learned on micros. It is time for more users to stand up and say that SQL is snake oil.

Rigid syntax

Advocates of SQL admit it is neither structured nor a language and argue that SQL is only an "access language" that provides a standard way for users and programmers with different backgrounds to do simple queries, reports and updates us-

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Roland is president of the Starwood Corp. a consulting and software development firm in San Antonio. He is the principal author of a family of accounting and management applications for commercial, local government and academic organizations.

BOON

BY RICHARD FINKELSTEIN

To be pro-SQL is to be pro-technology. But SQL's mercuric rise in popularity makes it the target of a lot of criticism.

The problem is, the issues surrounding Structured Query Language are clouded by many nonissues that keep surfacing and serve only to divert attention away from the crucial question: How do we make SQL more usable?

Here are some of the more common nonissues — or myths — that have circulated in the past year.

Myth 1: "SQL cannot be used to develop full applications."

Of course not. It was never meant to replace procedural languages. SQL is a data base sublanguage that gives users a standardized way to access data stored in relational data bases. It can be used interactively by end users, or it can be used within programs by application developers.

It is not a full application development language; it is not a report writer; it is not a screen or form generator; it is not an end-user query tool. But it can and should be the basis for all of these functions.

I can further argue that Cobol, Pascal and Ashton-Tate Corp.'s Dbase are not complete development languages either. To turn them into development environments, procedural languages are always supplemented with report writers, screen generators, debuggers and the like. This does not make procedural languages useless.

SQL products, such as Relational Technology, Inc.'s Ingres and Informix Software, Inc.'s Informix include language interfaces that permit developers to embed SQL in procedural languages such as C. Programmers can

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Finkelstein is president of Performance Computing, Inc. in Chicago and is publisher of the "SQL Review" newsletter.

CHRISTOPHER BING

- **Fit for programmers vs. end users**
- **SQL as an applications language**
- **How standard is standard?**

Bane

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ing a variety of data base management systems. Supporters laud SQL's rigid syntax and restricted set of command primitives because they make it almost impossible to do anything that is not correct — even if they make it difficult to do anything at all.

There is no harm in vendors offering a standard access language as an adjunct to their main data base applications language. But to support SQL, they must too often kludge their products, and SQL is so difficult for most people to learn and so inefficient in its use of computer resources that one is compelled to ask if there is not a better alternative.

Furthermore, too many people are trying to build complete development languages as supersets of SQL. When they find that SQL does not make a very good foundation for an applications language, instead of admitting this approach does not work, they often try to sell the result as Holy Writ.

Credit where it's due

SQL has often been praised for things that are not attributes of SQL proper but rather attributes of the underlying DBMS that uses it. SQL is not a DBMS. It is simply a command interface to the user.

Most users I know hate SQL, not because they are resistant to change but because it is not well designed for most of the purposes important to end users and programmers. What SQL is good for is that it forces users to buy larger, faster and more expensive hardware than they really need.

A well-designed access language can carry the weight of a standard if it is strong in two main areas:

- It should permit any nonprogrammer who knows how to manually manipulate the data in an application to express that knowledge in simple English-like commands to the computer. People manipulate data manually one record at a time, and no access language like SQL that does not support record-at-a-time commands will do this well.
- It should permit any nonprogrammer to easily import data from and export it to external files and other application programs and DBMSs, not just for one-time data conversions but on an ongoing basis. SQL does not address this purpose very well. Standard import and export commands and a few standard external data formats would serve that intent better.

But such a standard access language should also satisfy one other condition: It should be a proper subset of a complete data base applications language that is well designed to support a full range of applications without having to resort to a host language or a mixed bag of tools.

It should not be necessary to distort the design of the language as a whole to accommodate the standard subset, as it is when that subset is SQL. Rather, the subset should be designed to support the complete language in a seamless manner, with a simple, elegant and consistent syntax and a set of primitives that is neither more nor less rich than it needs to be for nonprogrammers to learn and use easily.

At the same time, it should provide an easy upward migration path for the programmer as he grows from novice to professional and give that programmer as much control as he wants and can use at each skill level.

SQL is so rigid and restrictive that it resembles a kind of high-level assembly language that is missing part of the complete instruction set. We need to focus on the design of a complete data

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Alternatives to SQL

Two current data base products that outshine SQL products are Progress from Progress Software Corp. for Unix, Digital Equipment Corp. VMS and Microsoft Corp. MS-DOS machines; and Ideal from Applied Data Research, Inc. for IBM mainframes. These products are remarkably similar in their syntax, although developed independently.

The products differ in that Ideal is a fourth-generation language for Applied Data Research, Inc.'s Datacomm/DB and also generates SQL for use with IBM's DB2. Progress is a stand-alone product that combines a fourth-generation language, DBMS and a complete development environment.

As fourth-generation languages, Progress and Ideal are not based on SQL and do not quite conform to the standards set by E. F. Codd for relational data base products [CW, Oct. 14, 1985]. They are, however, much more useful than most other products for developing applications, and much of that utility arises precisely from the ways in which they depart from SQL and Codd's standards.

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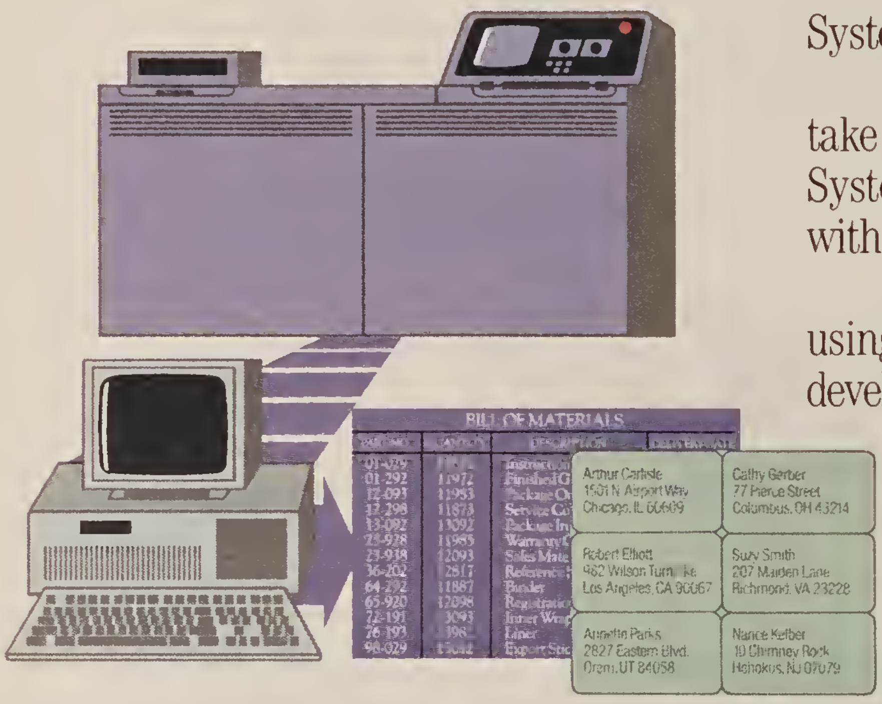

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A critic's look at data models

What is the importance of a theory or data model to data base and applications development tools? Is it possible to write a single theory that every tool must conform to before any tool is realized or tested?

Is that theory relational theory, and is that data model E. F. Codd's? Or should theoretical models be tested against the practical needs of users and programmers and discarded in favor of better ones if they are inadequate?

Three models. Data base tools are often said to be based on one of three models: "network," "hierarchical" and "relational," suggesting they are both exhaustive and mutually exclusive. But reality is not that simple.

Dissatisfaction with the network and hierarchical models stems from previously inadequate theoretical treatment of them and from some rather poor realizations of those models. A hierarchical product like IBM's IMS is a kludge, although it performs well for some applications. But a product like MDBS III from Micro Data Base Systems, Inc. does a far better job of exploiting the potential of the network model than anything done to date on mainframes.

When it becomes available on mainframes, it is likely to greatly alter the common perception of the network model's potential, and it is accompanied by a theoretical treatment that is far more advanced than relational theory.

Graphs. The most general model for representing information is the finite-directed graph, which can be visualized as a network of nodes connected by arrows. It is the basis for the network data base model. Graph theory has been developed to answer some of the mathematical questions associated with the model, but there is a need for a great deal more work toward better knowledge representation and data base management. Still, many products based on a restricted version of this model are in widespread use. They are called spreadsheets.

Trees. A more restricted model is the tree — a finite-directed graph with only one path between any two nodes. Ostensibly, this is the data model for hierarchical data base tools. However, there is a dramatic contrast between older hierarchical products and a language called Nial. This language is based on array theory, which, in turn, is based on the concept of the nested array, each element of which may be a data item of any of several types, including anothor array.

Anyone who thinks the relational model is sacred should try using Nial for a project sometime. It can give users an entirely new perspective on the issues involved. To the extent that an application can be represented by a nested array, the tractability problems of networks can often be avoided.

Relations. Even more restricted is the relational model, ostensibly based on the mathematical concept of the "relation," defined as a subset of a set of objects we may call "n-tuples" — well-ordered sets of objects, each of which is selected from a component set. Set theory's concept of the relation applies to data base management in that most business transactions generate data that can be organized into similarly structured records composed of fields that can be collected into files. It is natural to represent records as rows in a two-dimensional table of data, in which the fields correspond to the columns. The rows can then be treated as the n-tuples of a relation and the columns as the components or attributes.

Relation theory has two main branches, relational algebra and relational calculus. The theory is useful, but the lack of structure in the concept of a relation deprives the theory of usefulness beyond a certain point.

It may be possible in principle to represent all of the data in a situation as values in tables. But if in practice that means a large number of small tables with a small number of records — or perhaps only one — in many of them, then most of the real action may be in the data dictionary or meta-schema, which may or may not be represented as a table, or in the programs of the query and manipulation language.

If too much information resides in the data dictionary or programs relative to the data tables, or if there is too much information in the mechanisms that attempt to maintain referential integrity, then it is likely that complex data dependencies are the reason.

In that case, the programmer winds up using a relational product to realize what is a hierarchical or network model at the application level. This is why spreadsheets are so popular for many business applications. They often provide better support.

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base language, not just on a restricted access language.

In arguing against SQL, I am not against treating its functionality as a point of departure for further development. But I am against the rigidity of its syntax, some of its keywords and most of its restrictions.

Valuable, but . . .

The ideas SQL attempts to realize are valuable. But to standardize on it at this point is like trying to design an ideal keyboard with the restriction that the first six keys on the top row be Q, W, E, R, T and Y. Adopting SQL will have a similar effect, distorting the design of anything built around it.

Standards can do at least as much harm as good. For example, I consider the term "relational" to be inappropriate, at least in the way it has come to be used. It is not just abused in the ways E. F. Codd complains about but also in the ways he uses it. Is a data base tool relational if it supports all the operations and objects of relation theory — and perhaps others as well — or only if it is confined to those operations and objects, requiring no other theory to describe it?

Codd is inconsistent because he uses relational both ways. What we need is a new term — one that has no other meaning — that conveys the notion of "best design for a data base tool to develop and support business applications." Since we are starting to name computer languages after women and since such a tool is likely to be some kind of language, I propose the hypothetical ideal language Carol, for canonical record-oriented language.

For a tool to approach that ideal is to become "carolic."

At this point, Carol is not a particular language. We are all free to debate about what Carol's specifications should be. It may or may not be confined to the relational model. Codd could write his own 12 specifications for a carolic data base tool, and we could debate the choice and adequacy of each of them.

Eventually, a new, more adequate and more coherent theory of data base tool design may emerge and become established as various theories are tested in practice. Only then will it be appropriate to settle on some kind of standard language for query, data definition, data manipulation and reporting.

To get the debate rolling, I submit some specifications of my own for Carol. These specs are not intended to be complete or authoritative; the reader should judge them on their own merits.

Spec 1: To be carolic, a tool should maximize all the software metrics and submetrics (see story page 101) both for itself and for the applications one develops with it. This is a broad specification and open to interpretation, but it serves to put the entire subject in perspective.

Spec 2: All information pertinent to an application can be represented as values in arrays, which can be nested. This includes the data dictionary or meta-schema. It also includes the application programs. Spec 2 goes beyond Codd's Rule 1, which requires only data base information to be kept in tables. Spec 2 requires that everything can be treated as data at some level.

Spec 3: All operations operate consistently on all arrays, and all yield arrays as their result. The results of any such operation are bindable to a name, which can be used in further operations, making the language extensible. The syntax used for

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Bane

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data definition must be the same used for query and manipulation at any level.

This means that unlike SQL, there would not be different commands for tables and records. A table would be a record in a higher table. There might be, of course, one supreme table of tables, fields and indexes — the meta-schema.

Spec 4: All functions, including query, manipulation, definition, integrity, report writing and security, are implemented as a single, coherent functional language with a consistent, ergonomic syntax that supports all aspects of development through complete accounting and management applications, but that does not distinguish between arrays except by name. All tables are treated alike, using the same syntax, even the meta-schema tables. No standard sublanguage is supported that does not meet this specification. No patched-up kludges. No SQL.

Spec 5: The data base tool supports programmer productivity without depriving the programmer of control. This means that while it should support nonprocedural multiple-record-at-a-time syntax if that contributes to productivity and other metrics, it should also permit procedural single-record-at-a-time operations if the programmer needs them.

Multiple-record-at-a-time syntax should be regarded primarily as a productivity feature, not as something sacred or essential for avoiding incorrectness. Single-record-at-a-time programs can be validated, too. Correctness and ease of validation are important, but they must be balanced against other metrics. In the real world, there are too many situations in which what must be done with one record depends on the outcome of what was done with the previous one, and where it is better to store dependent variables as field values than to recalculate them whenever they are needed.

Spec 6: It supports indefinite chains of indirect addressing of data values through nested JOINs and by support of the use of array or table names, as values in any array. It should have operations that can address an array value not only directly by its table name, primary

Product metrics

The following are concrete values that software or software development projects can demonstrate to varying degrees. Properly weighted, they can yield an overall measure of the value of software for a particular purpose.

Fertility:

- Programmer skills — Does it help improve them?
- Team effectiveness — Does it help improve it?
- Personnel satisfaction — Does it make the workers happy?
- Reusability — Can it be used in future projects?
- Serendipity — Does it produce unanticipated products or benefits?
- Knowledge — Does it help users discover something useful?

Performance:

- Correctness — Does it give correct results for all input values?
- Speed — Is it fast enough or as fast as it can be?
- Efficiency — How well does it use system resources?
- Reliability — Does it fail under normal operating conditions?
- Tractability — How fast does the computational effort increase in relation to an increase in the size of the problem?
- Criticalness — How important is it to the larger system of which it is a part?

Usability:

- Trainability — How easy is it to learn?
- Flexibility — Can it be used in ways not specifically anticipated?
- Operability — Can it be used rapidly, easily and with little operator error?
- Compatibility — How easy is it to use with other systems and products?

Supportability:

- Simplicity — How easy is it to understand?
- Testability — How easy is it to find out whether it will work?
- Maintainability — How easy is it to find and correct bugs?
- Portability — How easy is it to move to other machines or environments?
- Interoperability — How easy is it to make it work with other systems and products?
- Expandability — How easy will it be to add capabilities without having to redo what has been done?

Integrity:

- Fault tolerance — Does it crash too easily if a fault condition occurs?
- Impenetrability — How difficult is it to crack?
- Recoverability — If a crash occurs, how easy is it to recover, and how well does it recover?
- Auditability — Can results be traced back to their sources?

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key value and column name but also indirectly — by the table name, primary key and column name of fields that contain the name of the table, primary key and column name of that referenced item. Indirect addressing should be extendable to any depth.

This capability can provide some of the advantages of a network or tree model while preserving the advantages of the relational model.

Spec 7: It supports the use of named indexes to control the order in which functions execute. It is not very practical to have to, in effect, redefine an index every time one wants to get something done in a certain order. Indexes should be built during data entry, not whenever a query or report is invoked, as SQL does.

> IT IS NOT practical to have to redefine an index to get something done. Indexes should be built during data entry, not when a query or report is invoked.

The language should try to select the best index for a given job if none is named, with the ultimate default index being the primary index. But the programmer must sometimes be able to control the order of execution, and naming an index for an operation is the best way to do that. SQL, however, doesn't permit this.

Moreover, storage representations and access methods are often important to an application in ways the programmer must control, and the exercise of that control is information that is to be represented as data in tables. If a consistent syntax is to be used for all data, then the language must support control of storage representation and access methods.

It might be nice for the product to support these functions without intervention by the programmer, but it is not practical. This is a rejection of Codd's Rule 8.

Spec 8: It supports control of whether an array or the result of an operation on arrays is stored on disk, kept in memory or shared with other operations or users. It also supports control of the timing of execution and the binding of values to their variables.

This covers the subject of views, memory variables and other issues as well. It contemplates the ability of a program to reduce an array operation algebraically without having to evaluate it or holding evaluation in abeyance until it is needed.

Spec 9: Each data type has a null, a fault and a default value, and the programmer has control over whether the default value gets substituted for a null or fault value when one occurs.

The programmer should also be able to control whether null and fault values are sorted ahead of or behind all regular values and whether any operation is to act on null or fault values, propagate the results as further nulls or faults or ignore them. He should also be able to dictate the exception action to be taken if either is encountered.

A fault value is distinguished from a null in that it is the result of an illegal operation, such as overflow or division by zero. For some purposes, it makes more sense to enter a fault value than to terminate execution with an error message. The default value is the value supplied when no value is entered. This also means that the primary index field, if there is only one, can contain at most one instance of each, to preserve uniqueness.

Spec 10: A default primary index is automatically defined if the user does not define another one. The default could be a sequential record number, a hash code that preserves the order of creation or an index on all fields in ascending order.

Spec 11: All operations that result in output to a peripheral should support default output formats appropriate to the peripheral. The formats should be well laid out without the user having to specify format details, but it should support such formatting conveniently if the programmer wants to depart from

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the default. In other words, the default formats should support rapid prototyping.

Spec 12: It supports authorization control of program execution, read and write privileges at the file, or table, and field levels and create and delete privileges at the record level. It also permits the definition of classes of users, some of whom can only run certain programs and others who can also access the data dictionary and develop applications.

Spec 13: It supports both system and transaction recovery, but the programmer retains control over which block of code constitutes a transaction and what conditions require that a transaction be undone.

Spec 14: Terminal displays support multiple frames or windows, scrolling and terminal attributes like highlighting, underscoring, reverse video, blinking, color and line graphics at a minimum. Printer output should support full printer control using some standard page description language.

Spec 15: It supports such functions as the ability to timestamp records from the system's real-time clock, a rich set of audit functions and the ability to roll back the data base to previous states.

Spec 16: It supports standard commands for importing and exporting data to and from a variety of devices, interprocess pipes or streams, other running programs and files using a variety of file formats. It should support calls to external programs.

Spec 17: It supports date, time, dollar and other user-defined data types in a variety of formats and a full set of time and date arithmetic functions. It supports masks for character and numeric types as well as range and other validation tests at both the meta-schema and program level.

Spec 18: It supports a user-programmable, context-sensitive Help facility, the ability to define functions on function keys and the ability to respond to single keystrokes.

Spec 19: It supports recursion, user-definable operations that extend the language — named stacks — and multiple simultaneous calls to the same file, using views or buffers.

THERE IS enough well-founded dissatisfaction with SQL that attempts to get it adopted as a standard are neither justified nor likely to succeed.

Spec 20: It is accompanied by its own syntax-checking editor that supports multiple windows and files and a debugger that clearly identifies bugs, gives easily understood error messages and suggests corrective actions.

Spec 21: It supports compilation into stand-alone applications that do not need a runtime interpreter. It also supports an incremental memory compiler for prototyping.

Spec 22: The compiler should support either nested include files with parameter passing or the ability to treat any fragment of executable code as a data value to facilitate the skeletonizing of program code and the writing of program generators.

Run a reality check

Needless to say, no existing product satisfies all these specifications. Some may turn out not to be good ideas or they might not combine well into the same product. The only way to find out is to create a product that embodies them and try the result.

There is enough well-founded dissatisfaction with SQL and related products that attempts to get it adopted as a standard are neither justified nor likely to succeed. Standards have their place, but specifications for as-yet-unrealized products should be considered prototype design objectives, not standards.

Ultimately, we do indeed need a standard — but a standard for a complete Carol, not just for a small subset of one, such as SQL. We need to design the ideal data base tool, and we should realize and test our designs before trying to establish any of them as standards. •

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use powerful relational operations to access data. Applications are also insulated from physical and logical data base changes and are inherently more flexible and easier to maintain. In other words, SQL does not replace procedural languages; it makes them a bit more bearable.

Myth 2: "We don't need a standard. We've been doing just fine."

Consider a standard operating system such as DOS or Unix and how it defines a large target-user base for vendors. Suppose vendors had to develop software for a dozen or even a half-dozen operating systems. Vendors would be so busy porting from one operating system to another that the quality of the applications would suffer.

Standard SQL interfaces decrease costs to vendors and consumers. They also open up the possibility of a whole new set of applications that communicate between themselves and a variety of local and remote data bases. You could argue — with some merit — that standards suppress creativity to a certain extent.

But every environment has limited resources and must direct them to areas that will yield the most economic benefit.

Using SQL and data base server engines, vendors can concentrate their creative efforts on opening up new vistas instead of reinventing the wheel.

Myth 3: "There is no SQL standard."

There is some truth to this myth. The official standard, ANSI SQL, is highly diluted and not very reasonable. With no provision for creating indexes, dropping tables, indexes and views or altering table definitions, ANSI SQL is unforgiving.

Most SQL data base vendors support the more complete IBM version of SQL as defined by IBM's Systems Application Architecture. The fact that there is no single concurrence at this time — though ANSI and IBM SQL will probably converge during the next few years — does not diminish the usefulness of SQL. Yet, it would be appropriate for third-party vendors and users to consider the cost of living with the current confusion and make their feelings known to ANSI committee members, many of whom are data base management systems vendors and very responsive to the desires of impatient users.

Myth 4: "Because SQL has many different dialects, it cannot be used for standard communication."

Tell that to Apple Computer, Inc., Micro Decisionware, Inc., Must Software International, Gupta Technologies, Inc. and Lotus Development Corp. — all of which developed standardized links between data bases using SQL.

All languages, including English, fall into dialects. This does not mean that a certain baseline cannot be established to make communicating feasible.

It is true that eliminating dialects would save vendors development resources and bring application solutions to the market faster. But considering the free market system and the desire of SQL DBMS vendors to differentiate themselves, there will always be dialects.

Proof positive of SQL's usefulness as a standard lies in the fact that many products, including Network Innovations Corp.'s CL/I, Micro Decisionware's PC/SQLlink, Must Software's Nomad, Natural Language, Inc.'s Datatalker and Oracle Corp.'s SQL Net, all take advantage of the SQL language to communicate with different SQL DBMSs. Some vendors have even put extra intelligence into their products to take advantage of extensions to IBM's SQL. Nomad can support the SQL UNION command directly or it can generate the equivalent function for an SQL system that does not support UNION.

> SQL DOES NOT replace procedural languages; it makes them a bit more bearable.

Myth 5: "SQL is not useful because it is new and evolving."

A corollary of the dialect argument, this claim also does not stand up to scrutiny. The truth is that standards can evolve but still have great worth as long as there is some common baseline. SQL will be refined, but the underlying architecture will remain stable.

Users who wish to wait for a final version of SQL may spin their wheels for a very long time. I suggest you begin using SQL today. If you choose to use nonstandard SQL extensions, be aware that in the future, the standard may take a different path, and count the cost of the ramifications.

Myth 6: "SQL is useless to application developers since it does not support record-at-a-time processing."

The fact is, almost all SQL DBMS vendors support some sort of embedded SQL interface that allows record-at-a-time processing in procedural languages. Record-at-a-time processing is usually supported via a working storage area that stores the result of an SQL query, which can then be processed one record at a time.

But the question remains: Is record-at-a-time processing the best way of manipulating relational data bases? We have at our disposal powerful relational operators, including SELECT, PROJECT, JOIN, PRODUCT, UNION, RELATIONAL DIVISION, INTERSECT and DIFFERENCE commands. Instead of using

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these operators, we read all the data in a working area and process it as if those relational operators did not even exist. This may not be expeditious.

Rather than trying to support awkward interfaces to procedural languages that were never meant to process sets of data, it would be far more advantageous to use nonprocedural application development tools specifically designed to work on multiple records at a time.

The new application development tools must be architected to take maximum advantage of relational operations, or else they will be functionally deficient. Most of the innovative products in this realm come from the micro and mini worlds; over time they will migrate up to mainframes. A good example of things to come is Gupta's SQLWindows, which is based on event points that trigger SQL commands or other object-oriented functions. Rhodinius, Inc.'s Empress, Ingres and Oracle also use similar approaches.

Myth 7: "SQL cannot be used by end users."

"Cannot" and "should not" are two different arguments. I have trained hundreds of end users in SQL, and they have not experienced any trauma. Examples abound in journals and newspapers of how much simpler SQL is than other query languages developed in an ad hoc manner without regard to the relational operations.

SQL is concise and uses a consistent syntax, which makes it easier to learn. True, many questions do translate into complex SQL queries. On the other hand, most of these queries either cannot be done in other languages or require a substantial amount of procedural coding. Given the alternatives, I would not hesitate to choose SQL as an end-user query vehicle.

Furthermore, command SQL is not a user-only choice. Stored queries is another: DB2 uses stored queries in Query Management Facility. Prompted queries is a third: IBM's OS/2 Extended Edition Database Manager will include a prompted SQL that asks questions of the end user, allows the end user to select potential tables and fields from lists presented in windows and then constructs the SQL statement.

Other users may want to use a query-by-example approach. Users can check off items and specify conditions in a tabular representation of the tables. The system can then construct SQL statements from these instructions. In the future, we will see more advanced interfaces: Natural language front ends such as Datatalker can translate English questions into SQL. In a nutshell, end-user alternatives abound.

Myth 8: "SQL is not important to end users."

Probably not. What is important is the cost savings, time savings, flexibility and ensured growth path associated with relational data bases and SQL.

SQL also means end users will be able to take full advantage of future applications and advanced front-end tools. They will be able to share data bases and access information quickly and cheaply to meet immediate and changing requirements. All this is important to users. All of these benefits may not be available immediately, but SQL provides the path.

Myth 9: "SQL is only important in mainframe environments or large PC LAN-to-host networks."

True, one of the most important uses of SQL is to provide a common means of data interchange between heterogeneous hardware platforms and data base managers. SQL also provides a common means of accessing data in a centralized data base from a variety of end-user tools.

The centralized data base could exist on a network or mainframe, but either way, the vast majority of organizations — even small ones — will have one,

> GIVEN THE present alternatives, I would not hesitate to choose SQL as an end-user query vehicle.

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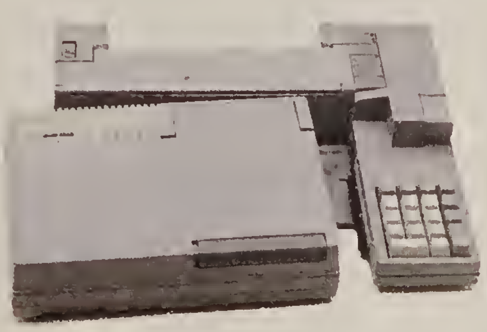


and MIS must provide convenient access to it. Even in a stand-alone environment, end users need to access a central repository of information using a variety of tools.

By using tools based on SQL, end users will be able to choose a variety of vendors' applications, all of which can access a local data base. Chances are that on the personal computer, IBM's Data Manager will become one of these stand-alone data bases that will encourage third-party vendor support.

Myth 10: "SQL is important only because the press is promoting it and IBM wants to sell hardware."

The first part of the argument is as simplistic as saying *Rambo* was a big hit because movie critics Gene Siskel and Roger Ebert liked it. SQL satisfies important user needs and was actually in heavy use on minicomputers before it became a major press item.

The second part of the argument is equally fallacious. IBM's support was certainly a major factor in SQL becoming the standard in place of other relational languages, such as Relational's Quel. On the other hand, even IBM does not have the power to enforce solutions that are not economically beneficial.

In fact, DB2's and SQL's popularity is probably as much a surprise to IBM as anyone else. IBM for a long time ignored the relational model in favor of its hierarchical model, IMS. If anything, IBM probably delayed the introduction of relational technology and SQL to the workplace.

Myth 11: "SQL has poor performance."

This is the last bastion when all other arguments fail. As it turns out, SQL consistently performs brilliantly on micro, mini and even mainframe computers. Benchmarks of products, such as XDB Systems, Inc.'s XDB and Gupta's SQLbase on micros, Sybase, Inc.'s Sybase and Ingres on minis, and Tandem Computers, Inc. machines and DB2 on the high end, show that relational data bases in general, and SQL specifically, perform faster and faster — and we are still in the embryonic stage of relational DBMS development.

SQL satisfies important user needs and was actually in heavy use on minicomputers before it became a major press item.

Myth 12: "There are alternatives."

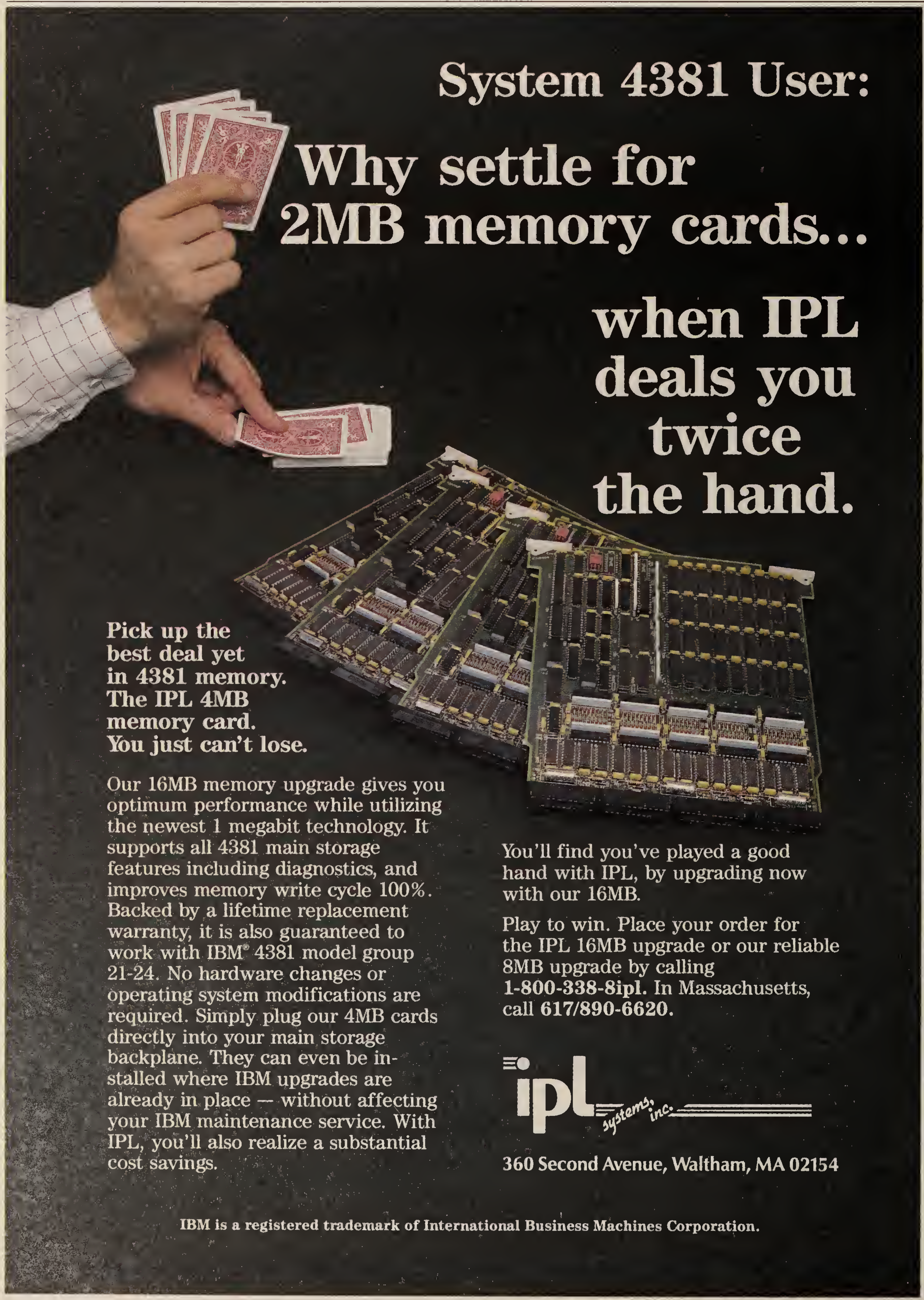
Opponents of SQL, or vendors who just pay lip service to the standard, have not offered any alternative. If one accepts the argument that standards are beneficial and that information exchange is crucial, then there must be some language to support these needs.

At one time, there were several alternatives. E. F. Codd at Codd and Date Consulting Group proposed his Alpha language 15 years ago with the idea of merging DBMSs and inferential systems (now called expert systems) — a magnificent idea that, had it been adopted, would have accelerated our use of relational data bases and artificial intelligence. Relational also offered Quel, which many feel is more concise and easier to use than SQL.

Neither of these languages ever received the widespread recognition that a standard needs, and unfortunately neither will likely become relational data base language standards. This leaves us with SQL. To my knowledge, there is no other potential alternative at this time.

Finally, SQL is not a panacea for all our problems. SQL promotes a communication and data interchange. This is the essential goal of information technology and something everyone involved in data processing should work toward. To the extent that SQL succeeds in this, it should be used. To the extent it hinders or fails, it should be altered.

SQL has moved us a long way toward greater freedom in information exchange. Could it have been done better? Almost certainly. Should it be disregarded because it didn't? Definitely not. •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TAKING CHARGE

James Connolly

MIS not an island

Reality can hit in two ways. The first is the bucket-of-ice-water-in-the-face method. It wakes up the sleepiest dreamer — immediately. The second method is more like Chinese water torture. It's not so bad now, but wait a while and it will get your attention.

The reality of the Oct. 19 stock market crash has struck the MIS world with both styles of torture.

The companies that took the ice water in the kisser first were those in the financial world that saw their systems severely tested by the massive trade volumes. The MIS groups in those companies learned within hours just how well-prepared they were for a trading blitz, with a few admitting later that they weren't prepared at all.

MIS in some of those same organizations and others that lost money Oct. 19 suffered another icy awakening within weeks, when it became apparent how much money the companies had lost. Budgets and jobs were slashed.

Almost eight months have passed since the crash of '87, and the water torture's drip, drip, drip on the corporate forehead is convincing the MIS manager that October was more than a passing curiosity. It was a reality that managers will have to deal with for several years.

Continued on page 114

Airlines' profits soar on wing of booking fees

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The major airlines' computerized reservation systems are extremely profitable investments, even though federal regulators have outlawed any bias in the reservation system displays, according to a revealing study by the U.S. Department of Transportation (DOT).

Since 1984, when the government banned the practice of favoring reservation system flights with the most prominent display, the systems vendors have still profited by charging high booking fees to other airlines participating in the system, the report said.

The DOT estimated that American Airlines parent AMR Corp.'s Sabre system made a profit of $178.1 million in 1986, achieving a 76% rate of return on its investment. Similarly, United Airlines parent Allegis Corp.'s Apollo system made a profit of $136.5 million, achieving a 52% rate of return on investment.

"The evidence . . . suggests that Sabre and Apollo have been, and almost certainly remain, extremely remunerative investments for their airline owners," concluded the DOT report, which analyzed confidential data obtained from the airlines.

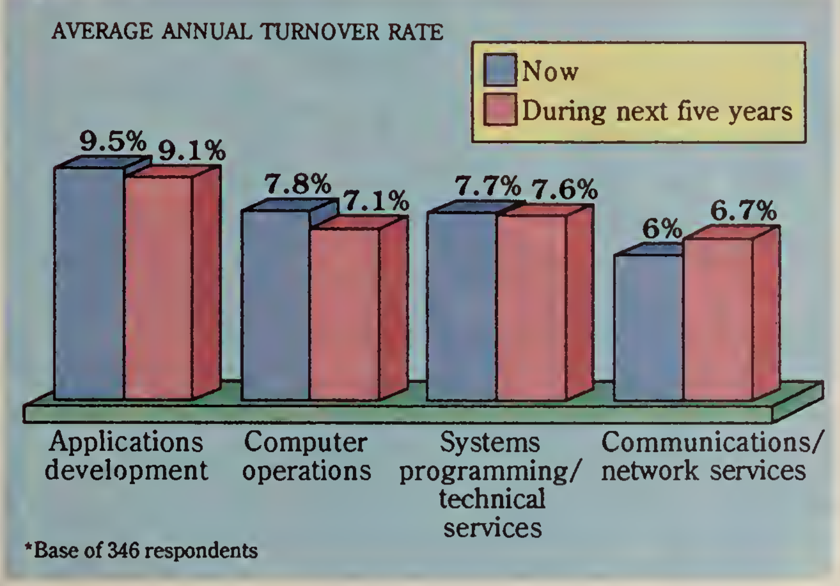
The reservation systems were developed in the late 1970s as marketing tools that put the computerized reservation systems vendors' flights at the top of system displays used by travel agents. But in 1984, the Civil Aeronautics Board outlawed dis-

Continued on page 110

Data View

Fewer staff changes ahead

*Chief information officers surveyed expect job turnover to slow for most categories of systems personnel during the next five years**



*Base of 346 respondents

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CW CHART

Learning by doing

Hancock's Boudreau 'humbled' by value of MIS

BY JAMES CONNOLLY
CW STAFF

It is a tough job moving from a nontechnical position such as treasurer to chief of an information systems group under the best conditions, and it is challenging when the company is in transition. But the challenge becomes frightening when the transfer is an emergency move to fill the job of a friend killed in a hunting accident.

It was frightening for Edward J. Boudreau Jr. in late 1986 when he took the place of his friend and, ironically, occasional hunting partner H. Alfred Colby as senior vice-president for information services at John Hancock Mutual Life Insurance Co. in Boston. Boudreau worked long hours to help employees deal with the loss of a respected executive, carry out decentralization, learn computer technology and cope with staff cuts.

But Boudreau sits in his office today showing a sense of accomplishment and also noting that the 70-hour workweeks in MIS are not as long as the 90-hour weeks he worked as treasurer during the company's cash-flow crisis several years ago. The long hours mean he does not get to see his 16-year-old daughter and 11-year-old son as often as he would like, but a personal computer at home provides him with some scheduling flexibility.

New perspective

Looking at his shift to MIS, 43-year-old Boudreau says, "What this assignment is doing for me is changing the way I look at business. I found out that finance isn't the only field that touches everyone. Technology touches everyone all the time.

"I started in this job with the idea of trying to understand technology as if I was still in the treasurer's or a chief financial officer's job, and that was how information technology impacts the bottom line," he says. "If you had asked me where our assets were, I could have taken you down to New York and opened a vault to show you cash. But our assets are basically the bits and bytes stored in our computers around the world. Learning that was a humbling experience."

Hancock's assets, he explains, are things such as the names of policyholders rather than just cash on hand.

The move to the information systems group, at which he is responsible for the MIS infrastructure, user support and telecommunications, has made Boudreau look at new career goals.

Continued on page 116

PROFILE

Edward J. Boudreau

Position: *Senior vice-president for information services, John Hancock Mutual Life Insurance Co.*

Mission: *To instill and maintain a business sense and understanding of Hancock's corporate goals within the information systems group.*

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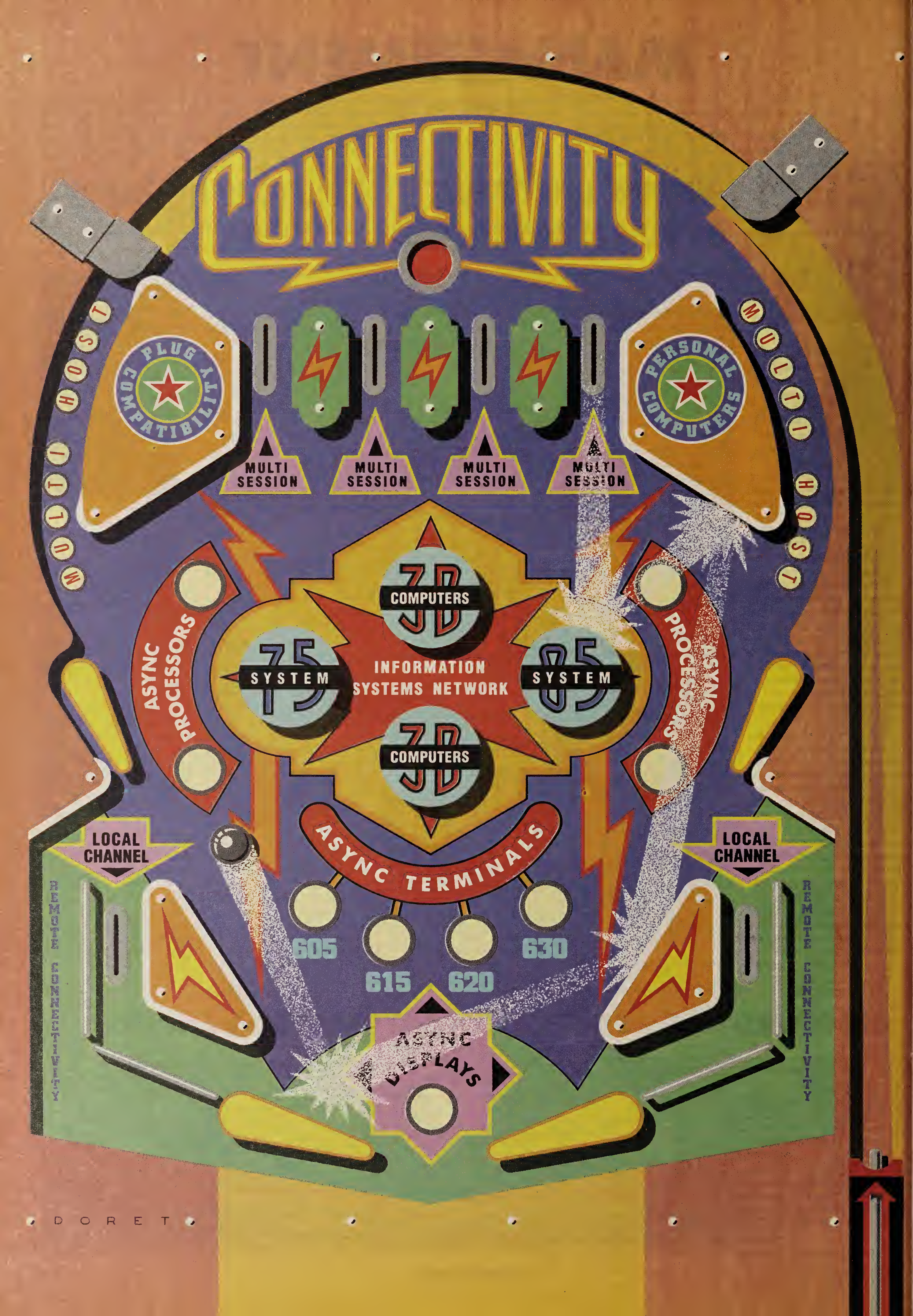
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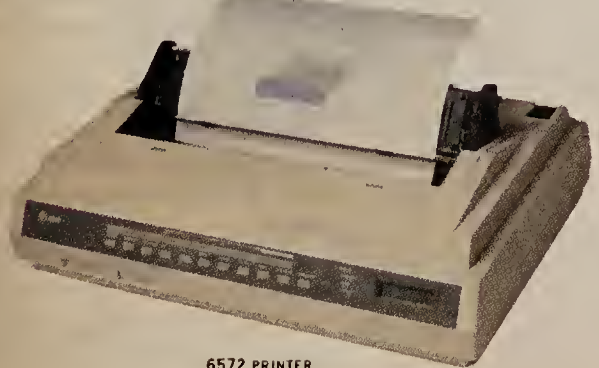

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Computer grads reap rewards

BY JAMES DALY
CW STAFF

BOSTON — If you are just getting out of college with a computer science degree and are looking to make some money, skip Horace Greeley's outdated advice about heading west. There are plenty of big bucks to be made in the Northeast.

At least that is the consensus of a report issued recently by the U.S. Bureau of Labor Statistics (BLS) in Boston, in which computer-oriented job seekers scored highly in both employment potential and earning power in a job market that observers say survived the October stock market crash virtually unscathed.

The report, produced by the regional BLS office, focused on graduates of New England colleges. BLS officials in several other regions reported that they have considered similar studies but have not yet undertaken them.

While the employment outlook for some 200,000 New England students graduating this spring is brighter than it has been in recent years, the demand for technical majors remains particularly keen, noted Anthony J. Ferrara, regional commissioner of the bureau.

But Ferrara said that although starting salaries for technical majors have remained high, they have not increased as dramatically as other professions because of defense cutbacks and some softening of demand in the high-tech market.

However, computer science graduates in New England should have no problem finding employment and can expect to earn $28,000 in their first year on the job. Only the $29,500 yearly paycheck for engineering majors outdistanced that of the computer science grad.

Placement plays part

There is, however, a great discrepancy in earnings power depending on where you land in the corporation; systems analysts nearly topped the list of the starting salaries of selected professional occupations at $31,600, and programmers were near the bottom at $22,600 per year.

And the good news promises to continue. The number of jobs for computer systems analysts is expected to grow 75.6% between now and the year 2000, according to the survey.

Compared with the nation as a whole, however, New England's greenhorn programmers are getting shortchanged while their systems analyst counterparts have caught the gravy train, according to another report.

A recent report issued by the Bethlehem, Pa.-based College Placement Council said the average national starting salary offer for a computer programmer is just short of $26,000 and a typical yearly salary for a computer analyst is a little more than $27,000.

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Airlines' profits

CONTINUED FROM PAGE 107

play bias, transforming the industry.

The airlines responded by turning their reservation systems operations into separate profit-center subsidiaries that charge high fees to other participating airlines, the DOT report indicated. It said that Sabre, Apollo and Texas Air Corp.'s System One require participating airlines to pay booking fees that are roughly twice the cost of providing the service.

For example, in 1986, Sabre charged airlines $1.84 per reservation, but the service cost only 79 cents per reservation. On the other hand, the airlines recoup only about 80% to 85% of their costs for providing the systems to travel agents, the DOT analysts said.

"In sum, it appears that if [computerized reservation system] vendors are exercising market power to exact above-normal profits, they appear to be doing so by targeting participating airlines rather than subscribers," the DOT report said.

Power trip

The study, released late last month, has political and antitrust repercussions because critics have charged that the reservation systems give the airlines too much power over the travel industry and should be divested [CW, Dec. 14, 1987]. The study was requested by congressional leaders to determine the profitability of reservation systems operations and whether the booking fees are excessive.

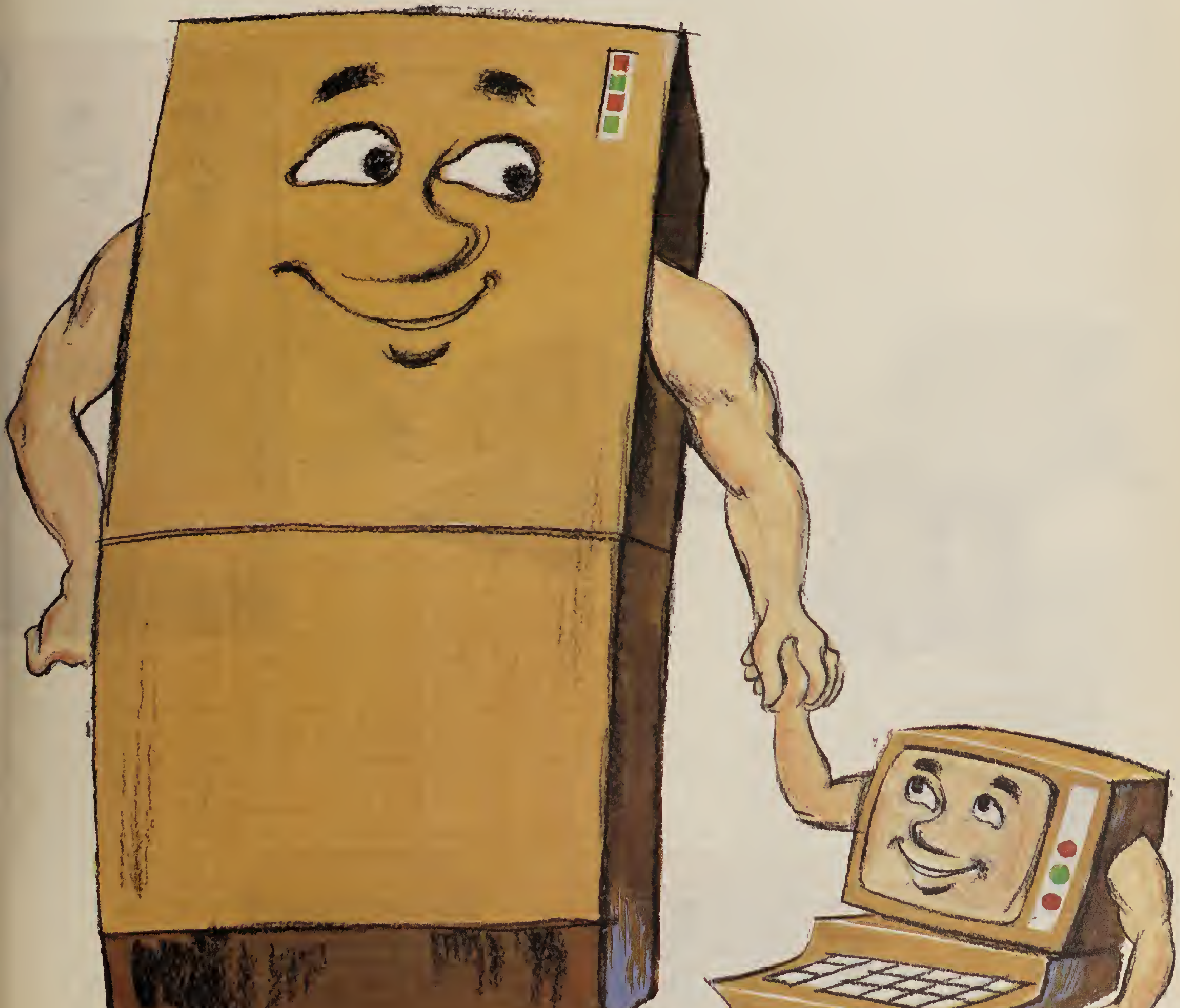
The DOT report also reached the following conclusions:

- Even though display bias was banned, travel agents still give preferential treatment to the airline that provides the reservation service, a situation called the "halo effect." The halo effect results from the continuing business relationship between the travel agency and the reservation system vendor, including financial inducements called override commissions.

In a calculation of the halo effect for the Sabre system, for example, travel agents using Sabre generate 40% more revenue for American Airlines than would otherwise be expected.

- Sabre has the highest market share — 35% of travel agencies — but System One has been leading a successful "conversion war" to convert travel agencies to its system.
- Several computerized reservation systems vendors are revising their systems to work with IBM's Personal System/2 microcomputers instead of with dumb terminals.

The PC war is over.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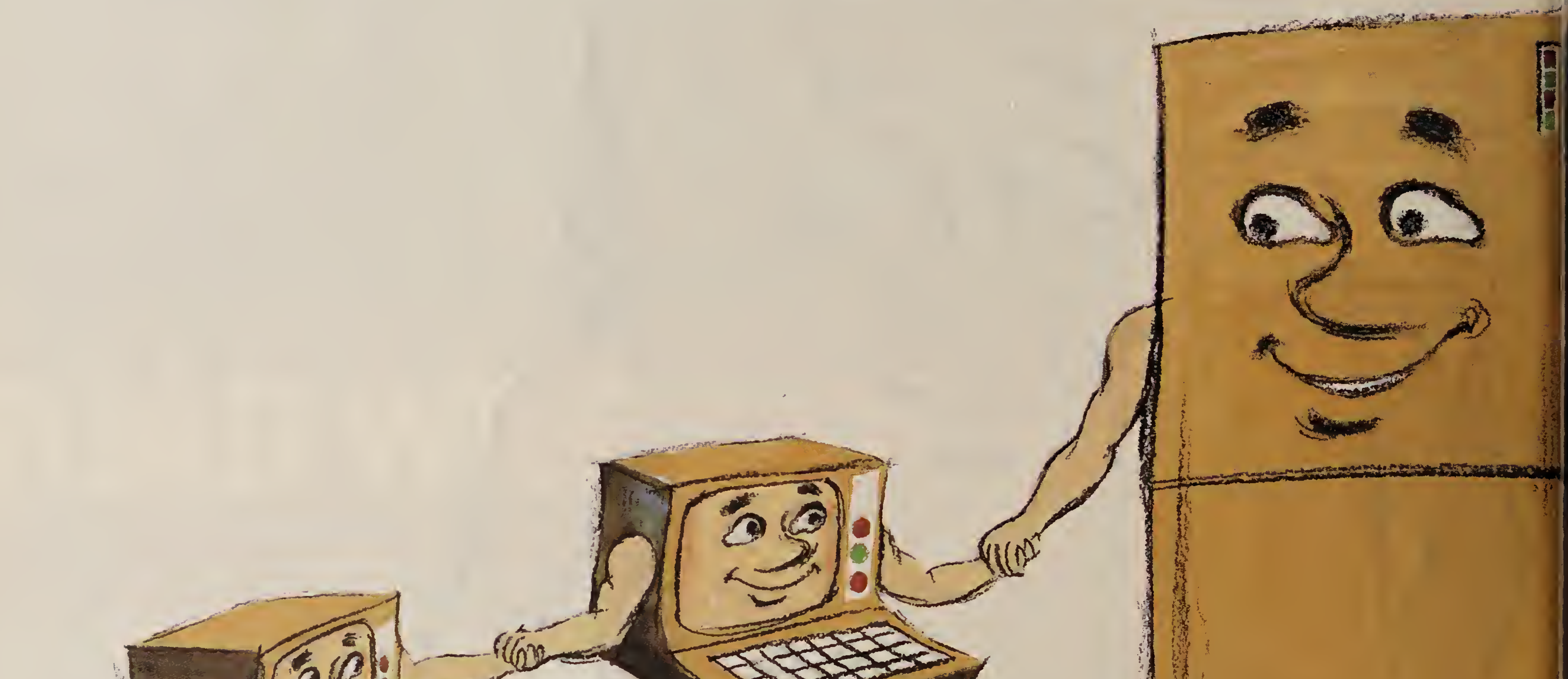

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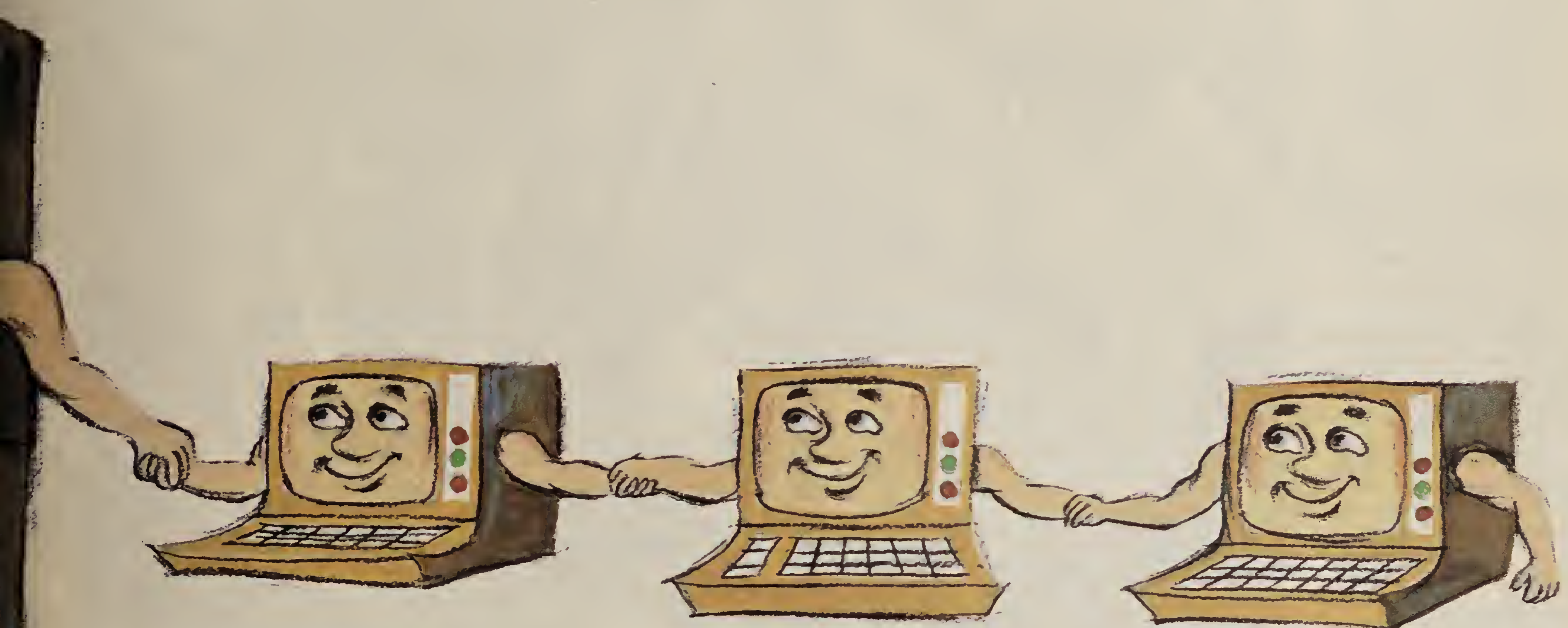


The PC war is over, and the computer professionals have won.

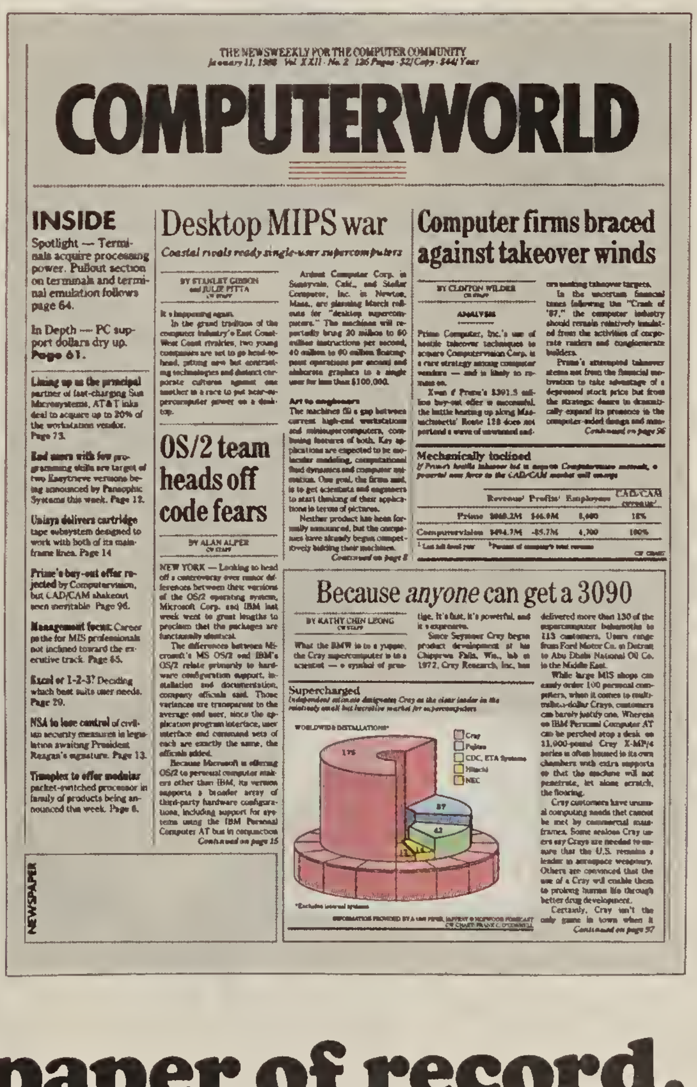
Almost overnight, the market for personal computers has changed. The individual user no longer runs out and buys whatever strikes his or her fancy.

PC's have grown up, and MIS has taken over responsibility for their role in the corporate information system. "During the past three years, everything has become integration," says Leon Jackson, senior research analyst at Arthur D. Little. "The only computer force that can provide integration is MIS."

The standalone personal computer has become part of a network. And MIS departments are working to set PC standards so that their organizations can benefit from sharing of information, including databases and software.

The stakes are huge. This year, companies will spend more dollars buying PC's than they will spend on mainframes.

And who will control this spending? The readers of Computerworld, of course. It's the newspaper of record for information systems management. Put your money where your market is. In Computerworld.



THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

INSIDE

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End users with few programming skills are target of two Easytrieve versions being announced by Pansophic Systems this week. Page 12.

Unisys delivers cartridge tape subsystem designed to work with both of its mainframe lines. Page 14

Prime's buy-out offer rejected by Computervision, but CAD/CAM shakeout seen inevitable. Page 96.

Management focus: Career paths for MIS professionals not inclined toward the executive track. Page 65.

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Timeplex to offer modular packet-switched processor in family of products being announced this week. Page 6.

Desktop MIPS war

Coastal rivals ready single-user supercomputers

OS/2 team heads off code fears

BY ALAN ALPER

Computer firms braced against takeover winds

BY CLINTON WILDER

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Connolly

FROM PAGE 107

The results of straw polls and formal studies seem to have a common undercurrent: Most companies survived Oct. 19, but there is an element of concern, and the results are tighter reins on corporate spending and long-term systems development, plus an empty feeling in some managers' wallets.

Almost anyone who has attended computer-related conferences and read business publications in recent months knows that plenty of companies are rethinking systems plans. MIS managers ask how they can increase production while spending less. Consultants respond with solutions: Focus on new systems and cut out the maintenance-hungry older applications, or cut out the new systems and focus on what you have.

Effect on the wallet

Take a look at salary survey numbers recently released by Edward Perlin Associates, a compensation management firm. The figures show that MIS managers' salaries and bonuses just aren't growing the way they were a year ago.

New York-based Perlin found that nearly one-third of the companies it surveyed experienced salary freezes or staff cutbacks in their computer operations, with the sharpest cuts coming in the financial sector.

But MIS managers' bonuses and salaries, like those of other employees, are tied to corporate profitability, and the combination of Oct. 19 and the generally intensified competition within various industries has hurt MIS executives' incomes.

Perlin found that average salary increases for top MIS executives dropped from 7.9% in 1987 to 3.6% in 1988. Average bonuses as a percentage of base pay dropped from 33% to 27%.

A Perlin executive notes that bonuses are a flexible method of compensation and can be reduced or withheld to cut costs. Last year they were.

All this does not mean that MIS managers are heading for the breadlines. Rather, the figures should serve as one more warning that MIS cannot consider itself an island within the corporation, exempt from budget cuts by executives who don't understand computers and would rather give MIS what it wants than deal with it. MIS has to strengthen its ties to the business units — that has been said before — and, more than ever, has to keep an eye on how appropriate use of computers can contribute to the bottom line and how inappropriate use can hurt.

Connolly is *Computerworld's* senior editor, management.

CALENDAR

JUNE 19-25

Timix Conference and Trade Show for users of Texas Instruments computers. San Jose, Calif., June 19-22 — Contact: Rosemary Colgrove, Timix Users Group, 512-250-7151.

World Computing Services Industry Congress. Paris, June 19-22 — Contact: Adapso, Suite 300, 1300 North 17th St., Arlington, Va. 22209.

Digital Optical Media Applications Conference. Monterey, Calif., June 20-22 — Contact: The Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Current Issues in Managing Information Technology: Enabling Organizational Change. Cambridge, Mass., June 20-23 — Contact: Center for Information Systems Research, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

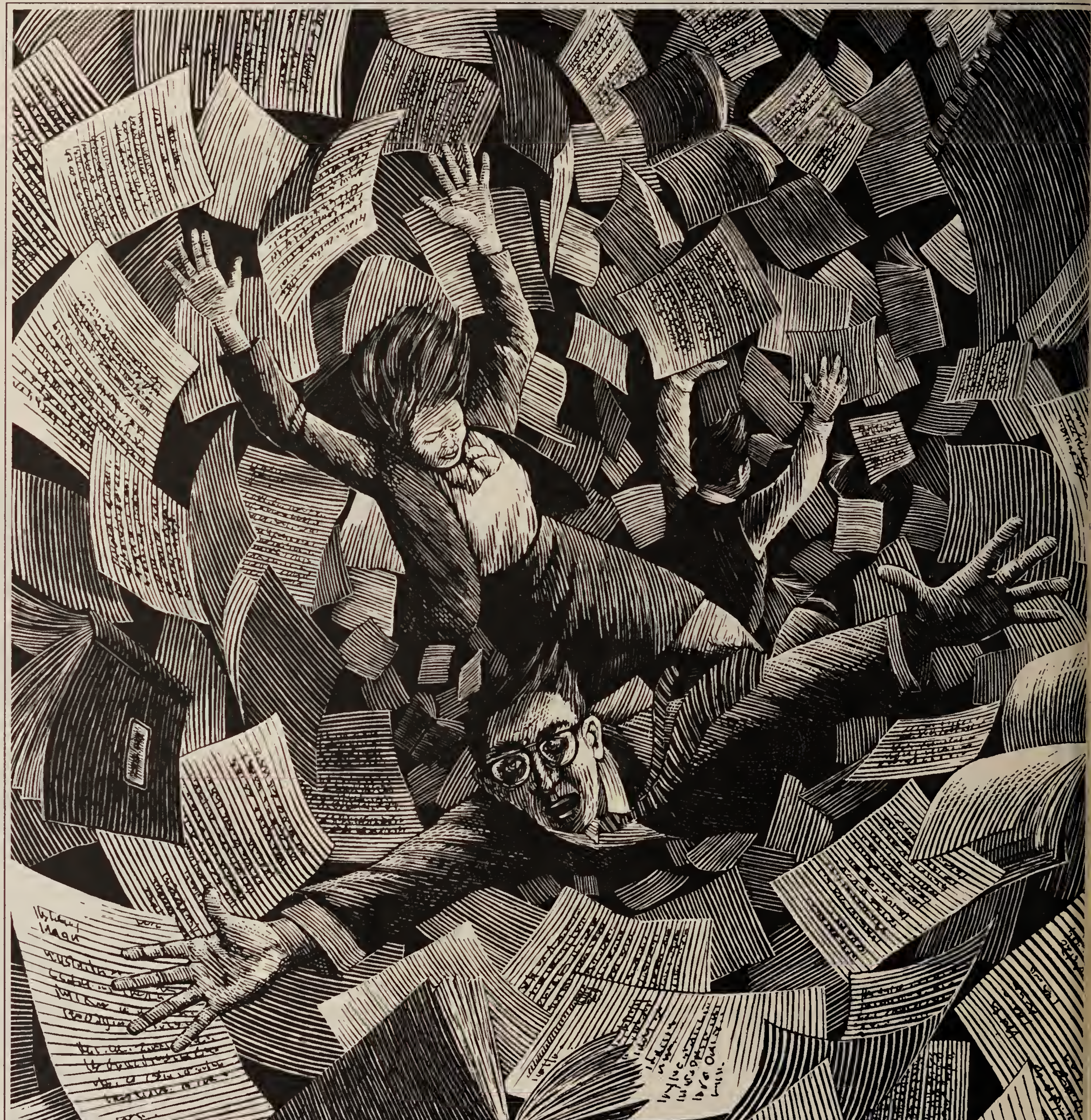
Expert Systems Conference. New York, June 20-23 — Contact: New Science Associates, Inc., 16 S. Main St., South Norwalk, Conn. 06854.

ACM Sigplan '88, Conference on Programming Language Design and Implementation. Atlanta, June 20-24 — Contact: David Wise, Indiana University, 101 Lindley Hall, Bloomington, Ind. 47405.

Usenix Association Technical Conference and Exhibition. San Francisco, June 20-24 — Contact: Usenix Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

"Telecom at 150" Conference Celebrating the 150th Anniversary of the Telegraph. Princeton, N.J., June 21-22 — Contact: Mauro DiDomenico, Committee Chairman, Telecom at 150, 435 South St., Room 2A-154, Morristown, N.J. 07960.

PC EXPO. New York, June 21-23 — Contact: PC Expo, 333 Sylvan Avenue, Englewood Cliffs, N.J. 07632.



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Force Field Analysis combats change resistance

BY JAMES CONNOLLY
CW STAFF

COLORADO SPRINGS — Implementing change in the face of resistance remains a challenge for the MIS organization, but there may be a way to cope with resistance in areas such as end-user computing, according to a Colorado Springs-based consultant and researcher.

"In an industry whose very nature is change-oriented, the theme is familiar: demand for change opposed by resistance to change. However, certain characteristics of the end-user computing challenge make it more pernicious than most other problems MIS has faced," Robert A. Zawacki said.

Zawacki, president of Zawacki & Associates and a professor at the University of Colorado at Colorado Springs, recently presented his arguments in favor of using Force Field Analysis technique on end-user computing projects.

Testing analysis model

Zawacki said that several companies, including several insurance firms that he declined to identify, are about nine months into the use of Force Field Analysis.

"We identify the driving and restraining forces. . . . What we are doing is pulling them out from under the rug and finally surfacing them and dealing with them," said Zawacki, who, with co-researcher Scott C. McIntyre, is conducting follow-up research on his initial Force Field Analysis by surveying MIS executives for their reaction to the program.

Zawacki promotes use of a Force Field Analysis model developed by psychologist Kurt Lewin more than 50 years ago to quantify the driving forces such as benefits and needs relating to a project and the restraining forces such as fears and lack of resources.

Robert A. Zawacki

Zawacki, who has organized the Force Field Analysis efforts at his client companies, advocates the formation of a team of 15 to 20 information systems employees and 15 to 20 end users to look at the implementation of a specific project.

During two days of work, the team determines the strengths of the various opposing forces and assigns each a length on a line scale. For example, in one analysis, resistance by middle management and supervisors is opposed equally by the driving force of changing U.S. and world economics.

Stuck in the middle

Zawacki noted that the greatest resistance tends to come from middle management.

"What they are seeing is that all these systems, both hardware and software, are being put in the financial group or service group, and they give you this argument about whether they are compatible and how much money they are spending out there, and they say we are reinventing the wheel and it's coming out square. That's what middle management and MIS is saying," he noted.

Zawacki said that once the opposing forces are identified, the team and the action officer whose job it is to carry out the project can attack a few key items — represented by the longest lines on the scale — and then focus their energies on those items.

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Learning

CONTINUED FROM PAGE 107

"I had always thought of myself as a CFO candidate; I had never thought of myself as anything but a financial officer. Since I have come here, I can legitimately see myself running a company," he says, encouraging anyone with aspirations for a senior management job to spend time in information systems early in their career.

In addition to running the information services group, Boudreau wears a second hat as chairman of Hancock's banking subsidiary, First Signature Bank & Trust Co. in Portsmouth, N.H. That was one of three positions — the others being a marketing post and head of a special project — he was slated to assume when he was being rotated out of the treasurer's job in 1986. But the marketing and special project posts were taken away when the management committee had to replace Colby.

One of Boudreau's first priorities was to complete an application development decentralization launched by Colby. That effort involved assigning 500 programmers, analysts and managers to business units. Within those units, a sector information officer oversees application development and reports directly to the sector president, who for the first time is assured of getting an MIS viewpoint on decisions. Boudreau also mandated postimplementation audits for information technology projects. He smoothed the transfer of the 500 workers by showing that opportunities to excel are greater in the business community.

While the decentralization progressed, corporate austerity moves, such as an early retirement program, further reduced the central information systems group from 600 people to the current level of 400. Boudreau, discussing his on-the-job education in computers, notes that company officials put the MIS staff at ease by explaining that the neophyte MIS director could draw on the 100 years of experience of his top five assistants. Months later, three of those five accepted early retirement.

But he says the departure of those "good people" helped him implement policies and bring in aides who more readily questioned why things were the way they were. Boudreau's own question — "Why do we have IDMS here?" — led to a lengthy review of the benefits and costs of Cullinet Software, Inc.'s data base management system. The review ended with a decision to continue support of IDMS for a few more years and to standardize on IBM's DB2. It was the first of a series of standardizations designed to cut costs and maintain compatibility among systems.

Stop, look, listen

One assistant recalls how the former treasurer learned about computers through conversation, reading and seminars. "Ed is very good at sizing people up, and he's a very quick study," says Andrea Mercier, Hancock's director/executive information system project officer. "He made a point of doing things like going to conferences. Now he always asks people for their opinions, but he doesn't necessarily adopt them. He has his own viewpoint now."

Mercier lauds her boss as a "people person" and a flexible manager who gives employees room to grow. She says one of his accomplishments has been to unite the people in Hancock's MIS community and give them a sense of the business world.

Boudreau says one reason he was brought in from the user community was to bring that business sense and an understanding of Hancock's corporate goals into MIS. But when asked to list his achievements, Boudreau turns to people issues and says, "I can name at least two dozen people who play a major role in this company, not for their rank, but for what they have accomplished, and I had some measure of responsibility in identifying or developing them."

He emphasizes teamwork and risk-taking in his management philosophy and draws some of that philosophy from sports heroes. He credits the daredevil baseball-great Pete Rose for the risk-taking element and basketball executive Red Auerbach of the Boston Celtics as a preacher of teamwork.

Boudreau's energetic conversation is filled with references to finance, computers, sports and dieting. He is an avid golfer, a permanent dieter who recently lost 20 pounds and a sports fan who points out a photograph of his brother, an assistant coach with football's New Orleans Saints. His coffee table is covered with computer industry and banking publications.

He also credits Colby, who like Boudreau moved into MIS from the user community, for his accomplishments.

Comparing his entry into MIS with that of someone who replaced an executive who quit, Boudreau observes, "In some respects it was more difficult for me because Al and I were good friends outside the office. If you sit in a goose blind with someone for seven years, you get to know him pretty well."

Boudreau says he has found himself thinking, "What would Al be doing differently in this situation?" He has also had to deal with an undercurrent of complaining, particularly on his early decisions in MIS.

"They didn't know that I knew what they were saying, but a lot of people were equating my decisions with throwing dirt on Al's grave," he says. "But they didn't know about my personal relationship with him. The foundation he provided here has allowed me to do what I've been able to do in the past year and a half. An important factor in my keeping the faith of our friendship has been making sure that he got credit for what he did."

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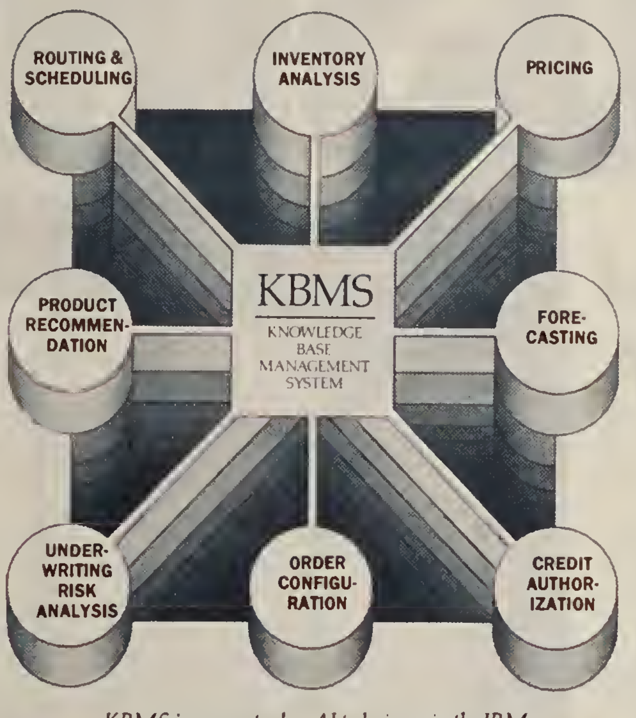

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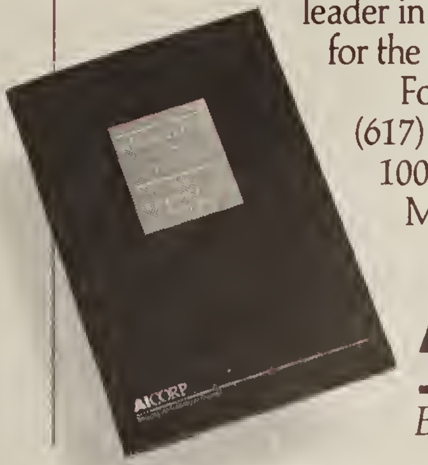

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INDUSTRY INSIGHT

Kathy Chin Leong

Promises, promises

Vaporware is the stuff that gets preannounced and never gets shipped. "Hypeware" is the stuff that finally gets shipped but was so overrated from the start that users are in for a giant letdown.

Let's face it: Hypeware is everywhere and gets users nowhere.

Sure, the industry has to market its products, but there's got to be a certain amount of openness about what a product can and cannot do.

Magic pill

I guess people in the industry can't help themselves. Imagine sweating over a project for more than a year. With tunnel vision firmly entrenched, the promise of what the product can potentially do seems to take on a life of its own. Product X is suddenly a panacea for every ill you can think of.

Take IBM's Netview, for example. Prior to Netview, users were relegated to the IBM Network Control Program, a key software program that helped users keep track of network devices. Users were frustrated by the fact that it was complicated to use and did not track anything besides IBM products.

So IBM responded. In May 1986, it announced Netview, a program designed to take care of the dilemma of what to do with other vendors' equipment.

But when the mainframe component finally shipped the following year, it was more of a diagnostic tool than a true network management product. As one observer put it, "It was really a repackaging of IBM's products from before. Users really wanted a full-function product that would help them find ways to troubleshoot and correct problems on-line."

As in the traditional vendor prose, added features are promised in the "next release" of Netview. This onion theory of product delivery has been a mainstay of IBM's product approach and that of many other companies. With the first layer of

Continued on page 123

Sun chairman scorches OSF

McNealy claims group is running scared, calls Unix stronger than ever

In the wake of last month's creation of the Open Software Foundation (OSF), Scott McNealy, chairman of Sun Microsystems, Inc., remains more optimistic than ever about his company's Unix strategy. In an exclusive interview in Paris earlier this month with Gerard Bidal of IDG Communications' French publication *Le Monde Informatique,* McNealy attacked OSF as an IBM-dominated scheme to bring confusion and vaporware to the Unix marketplace.

What is your reaction to the creation of the OSF?

We are very happy. Seriously. This is an opportunity to take advantage of. Unix began to be successful without the support of IBM or DEC. IBM and DEC are now strongly involved in the Unix movement, having announced their support publicly. We will use this argument, believe me. For example, we'll say to software companies, "Don't develop anymore for VMS, the Mac, OS/2 or any other operating system. Write for Unix. Because that's the direction everybody is taking."

But wasn't OSF created to stand in your way?

Of course. It's a counterattack. But it also provides us with weapons. Imagine IBM, DEC and Hewlett-Packard all behind Unix. The fact that we have made them nervous, so that they are working together, is just unbelievable. That said, I don't think IBM and DEC really wish Unix to be successful. At least for the moment. They hope, above all, to create confusion.

Sun's McNealy

But on which side is the confusion? There's not the least confusion about Unix System V running on Sparc, with NFS, News, X-11 and Open Look. Neither our specifications nor our plans for future products nor our sales forecasts have changed.

The confusion is around OSF. It still isn't a product and doesn't even have specifications. To be in competition with it is to be in a comfortable position.

How can OSF justify making you pay not only for a Unix license, but also royalties — perhaps as much as 30% to 40% — to IBM for AIX? Isn't there a risk of paying two or three times more for a license? There are probably answers to these questions, but nobody knows them at the moment.

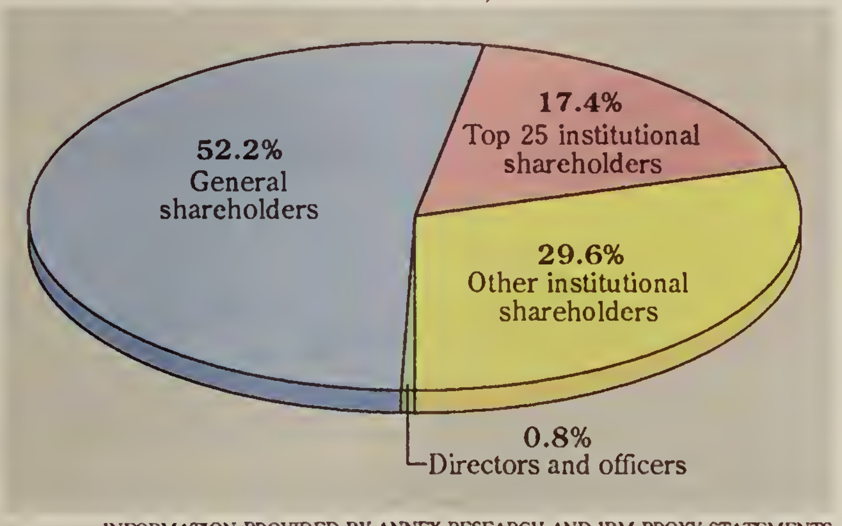
But once it exists, OSF's Unix could boast it is independent of all hardware architectures, whereas

Continued on page 125

Data View

Who owns IBM?

Institutional investors owned 47% of IBM's 603 million outstanding shares on Dec. 31, 1987



INFORMATION PROVIDED BY ANNEX RESEARCH AND IBM PROXY STATEMENTS
CW CHART

IBM loosens third-party parts policy

BY CLINTON WILDER
CW STAFF

Users who perform their own maintenance of IBM equipment and independent maintenance vendors will have greater access to IBM parts as a result of an IBM policy change late last month.

In a significant hatchet-burying with the third-party service industry, IBM rescinded an 8-month-old restrictive parts availability policy and agreed to reopen six parts centers. In addition, IBM agreed to provide 24-hour parts delivery to independent maintainers from its parts depot in Memphis.

The changes came after months of negotiations among IBM industry relations executives and the two largest trade groups representing third-party brokers and lessors of IBM equipment, some of whom also

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Inside

- IBM to sell education publishing unit. Page 120.
- France's Cap Gemini Sogeti plans further acquisitions. Page 121.

Tokyo chip negotiations hit impasse

BY JAMES A. MARTIN
CW STAFF

U.S. and Japanese chip makers recently proved they still cannot settle some of their trade differences.

Talks between the two countries in Tokyo reached an impasse over how to measure foreign access to the Japanese semiconductor market.

It had been hoped that the two countries could work out their disagreements without again getting the government involved. After the breakdown in talks, however, observers said U.S. chip makers may have to seek the Reagan administration's aid in implementing more punitive measures against their Asian counterparts.

The U.S., represented by the Semiconductor Industry Association (SIA), contended that market share is the most appropriate measurement of how well Japan is adhering to its agreement to buy American-made chips. The Electronic Industries Association of Japan, however, rejected the U.S. proposal, thus bringing the two countries' talks to a standstill.

At issue is the question of Japan's willingness to uphold the agreements it signed in September 1986 with the U.S.

In those agreements, Japan promised to cease its alleged dumping of dynamic random-access memory chips into the U.S. at below-cost prices and to buy more chips from U.S. manufacturers.

Although the dumping has stopped, the U.S. still has only about a 10% share of the Japanese chip market when, according to the SIA, it should be 12% to 14%.

Shared goal shrouded

American chip makers are "incredulous and astonished at the refusal of the Japanese electronics trade group to even acknowledge the well-publicized shared goal to increase foreign participation in the Japanese market," said Jon Cornell, a leader of the U.S. delegation in the talks and executive vice-president of Harris Corp.'s semiconductor sector.

"The only way to measure progress toward gaining access in the Japanese market," Cornell added, "is by steadily increasing market share commensurate with levels achieved in other major electronics markets worldwide, where ultimate success is fully determined by competitiveness."

The U.S., the SIA contended, has increased its commitment to supplying chips to Japan by expanding its Japanese manufacturing and design plants, increasing employment there by 27% and upping technical support personnel by 20%.

Japanese chip makers argue that American vendors do not manufacture the consumer electronics components that Japan needs and cannot meet production deadlines or quality requirements.

INDUSTRY WEEK IN BRIEF

Who says you only go around once? **Alcatel N.V.** completed the sale of its **Qume Corp.** printer subsidiary back to Qume's original founder, David S. Lee, for $20 million. Lee said his current company, **Data Technology Corp.**, will change its name to Qume and relocate to Qume's headquarters in Milpitas, Calif. Lee founded Qume in 1973 and sold the company to ITT Corp. in 1978. Alcatel acquired the subsidiary as part of its multibillion dollar purchase of ITT assets in 1987.

The financially strapped **Vermont Research Corp.** may be on the verge of going under. Management of the drum- and disk-memory maker said that if recent employee cutbacks and efforts to achieve more funding or a merge partner do not dig the North Springfield, Vt., firm out of its hole within 60 days, it will consider liquidating.

Cullinet Software, Inc. named Vice-President of Technology Jon Nackerud to its board of directors. Nackerud returned to Cullinet in 1987 after a seven-year absence in which he founded **Relational Technology, Inc.** and served as its president, chief executive officer and chairman. Nackerud fills the vacancy created by the resignation of former Chairman David Chapman.

Control Data Corp.'s second-ranking executive, Deputy Chairman Norbert R. Berg, announced he will retire June 30. Berg, 56, is a 29-year CDC veteran. Berg will continue to serve as vice-chairman of the board of directors.

AST Research, Inc. is folding its data communications product group into its systems product group, it said last week. The move is part of AST's efforts to streamline and, thus, cut expenses. AST, which used to be known mainly as a board company, said 75% of its revenue now comes from personal computer systems sales. No layoffs will result from the merger, AST said. Separately, AST announced a major distribution agreement with **Computerland Corp.** that will put AST's Intel Corp. 80386- and 80286-based PCs on shelves in Computerland's 800 retail stores.

Egghead Discount Software announced a $61.2 million initial public offering of its common stock at $17 per share. The Bothell, Wash.-based firm is the U.S.'s largest software-only computer retail chain.

Western Digital Corp. announced the proposed acquisition of graphics controller board maker **Verticom, Inc.** for $12 million in Western Digital stock. The merger has been approved by both boards of directors and is pending shareholder approval.

IBM sells publishing unit to London firm

Maxwell Communications plans to continue to develop SRA educational courses

BY ALAN ALPER
CW STAFF

ARMONK, N.Y. — IBM reached an agreement last week to sell its Science Research Associates (SRA) education publishing unit to Maxwell Communication Corp. for approximately $150 million.

SRA publishes educational materials and vocational tests and provides training courses for IBM hardware and software users.

In the educational market, the SRA sale will enable IBM to focus on areas more strategic to its information-handling business, the company said.

Service via hardware

Stephen T. Vehslage, vice-president of education for IBM United States, said IBM can better serve the educational market through its core businesses of computer hardware and associated software.

The Chicago-based SRA subsidiary is profitable, IBM said. It employs about 500 people. The acquisition also includes SRA subsidiaries in Australia, Canada and the UK.

SRA is a good fit for Maxwell Communications, a London-based publishing concern, because of its emphasis on educational publishing, IBM said.

Maxwell Communications will continue to develop training courses for IBM users and data processing professionals through SRA's Information Systems Education Division.

The companies expect to close the deal within the next 30 days, an IBM spokeswoman said.

IBM without CCA.

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Cap Gemini Sogeti denies raider rap

BY GERARD BIDAL
IDG NEWS SERVICE

PARIS — "We are not raiders."

So said Serge Kampf, chairman of Cap Gemini Sogeti SA, the French software and services giant. He argued that the company's recently acquired 29% share holding in the UK's Cap Group PLC is not indicative of a new turn in company strategy.

Speaking at a recent press conference to present Cap Gemini's financial results, Kampf claimed the firm has "not changed anything in our strategy. For 15 years, we have always been following the same line: We take minority positions in other companies without any assurances that we can become majority shareholders."

According to Kampf, launching a public takeover bid against the British software group had been considered by Cap Gemini officials for some time. But, he said, "We are not in a hurry. We will try to have a good relationship. If it's not possible, we will sell back." But he said Cap intends to hold its ground for the time being.

Kampf announced that Cap Gemini registered $706 million in revenue for 1987, a 43% growth from the previous year. Net profit grew by more than 45%, reaching $48 million, compared with $33 million in 1986.

Growth was partially due to the acquisition last year of French software and telecommunications company Sesa. For the last five months of 1987, Sesa contributed $97 million to Cap Gemini revenue and $4.7 million to profit.

Growth spurt?

But Cap Gemini, whose objective is to be among the top players worldwide, says it is not satisfied with the results. Even if a recent string of acquisitions in France and elsewhere have nearly exhausted the "war treasury," Kampf said, he does not want to put an end to the company's external growth strategy.

"Our loan capacity is huge," he said. "And we do not believe we have reached a critical size. We will continue to seize opportunities as they come."

Kampf did not deny having ambitions for the British software and services market, where Cap Gemini's presence is still modest.

Two-thirds of the firm's revenue last year came from outside France. European revenues grew to account for 41% of total revenues, compared with 34% in 1986. The share of business coming from the U.S. decreased slightly from 38% in 1986 to 36% last year.

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IBM loosens

CONTINUED FROM PAGE 119

offer maintenance. A "document of understanding" among IBM, the Computer Dealers and Lessors Association (CDLA) and the American Society of Computer Dealers (ASCD) contained the following highlights:

- IBM will reopen the parts depots it closed last fall in Phoenix, Tampa, Fla., New Orleans, Milwaukee, Miami and Jericho, N.Y.
- IBM will distribute to third-party maintenance companies specifications of engineering changes it makes to improve IBM equipment.
- Third parties may obtain the diagnostic equipment and other tools that IBM provides to its own field service engineers.
- IBM will provide lists of recommended spare parts, which theoretically can now be obtained from third parties.
- IBM agreed to first consult the CDLA and ASCD before making any future changes to any of its parts availability policies.

Big Brother is watching

In addition, IBM agreed to more closely police disparaging remarks made by its sales representatives regarding independent maintenance providers. That was significant, said CDLA Chairman Robert Gulko, because the parts availability issue was more a problem of perception than of substance.

"There was a perceived change, and that's what counts," Gulko said. "Users thought their maintenance companies wouldn't have access to parts, and, therefore, they might suffer."

Both Gulko and ASCD President Joseph Marion praised IBM for the agreement, particularly citing the opening of the Memphis warehouse to independent servicers for the first time.

"This is better availability than we've ever had before from IBM," Marion said. "Virtually any part will be available in 24 hours."

The new parts policy represents IBM's second revision of the aggressive policy changes that sparked a furor at the CDLA's fall meeting in Bermuda [CW, Nov. 9, 1987]. Earlier this year, IBM liberalized its terms for warranty service qualification for relocated and reinstalled CPUs.

"I think IBM realized that it created a monster for itself," Marion said. "By consulting [the third-party industry] ahead of time, it could have avoided a lot of problems on both sides."

Board bags Datapoint buy-out

Edelman's offer of $6 per share 'inadequate'

BY NELL MARGOLIS
CW STAFF

SAN ANTONIO — A group of Datapoint Corp. managers and investors led by Chairman Asher B. Edelman returned to the drawing board last week after their second attempt to take the company private in a leveraged buy-out was rejected by a special committee of the board of directors.

Pegged at $6 per share, or a total of approximately $60 million, the buy-out offer was turned down as "inadequate" in the wake of a fairness opinion issued by Prudential-Bache Securities, Inc.

Datapoint's director of investor relations, Gordon Cardigan, was unable to specify the shortfall between the offered amount and that which the directors in question might have deemed adequate.

However, he said, "the investment bank did carry on an extensive study of Datapoint's operations both here and abroad" before issuing its opinion.

The board's decision on the leveraged buy-out proposal is not yet final, and the proponents are considering other options, he said. Whether these options include an increase in the offering price or a withdrawal of the offer is not known.

Vacillation

Edelman followed his 1985 hostile takeover of Datapoint with an identical $6-per-share leveraged buy-out offer, which at that time totaled some $100 million because of a greater number of outstanding shares.

Several months later, however, he withdrew the offer, citing the troubled networking and communications firm's imminent return to the black side of the balance sheet.

Datapoint did emerge from the red two years later. Its fiscal 1988 third quarter, ended April 30, was its fifth consecutive profitable quarter, although profits dropped 39% from the year-earlier period.

Datapoint earned $2.7 million, or 2 cents per share, on revenue that rose 12% from year-earlier levels to a total of $88 million.

Service, stability outsells 'hot tech'

BY CLINTON WILDER
CW STAFF

OAK BROOK, Ill. — The minisupercomputer and high-performance workstation market has entered a new phase in which state-of-the-art technology no longer sells machines, vendors and analysts said last week.

Instead, a vendor's corporate credibility and ability to meet specific commercial customers' needs will determine its financial success, said panelists at Technologic Partners' Advanced Computer Systems conference in this Chicago suburb.

"The bar is moving up in terms of market requirements," said Gerald V. Butler, vice-president of engineering and scientific products at Prime Computer, Inc. "It's not enough to have a hot box. The customer base is changing from early adopters who wanted high performance to production environment users who want a vendor with worldwide service and financial solidity."

Most panelists agreed that the next two years pose a significant challenge to Convex Computer Corp., Alliant Computer Systems Corp., Sequent Computer Systems, Inc. and newer entries like Ardent Computer Corp. and Stellar Computer, Inc.

With early scientific and technical markets saturated, vendors are pushing into commercial applications in manufacturing and finance — just when IBM and Digital Equipment Corp. are planning to enter the fray more aggressively with advanced parallel processing technologies and vector facilities.

> "YOUR ability to tell your company's story in the early days is the most important thing you can have."
>
> CASEY POWELL
> SEQUENT COMPUTER
> SYSTEMS, INC.

"Your ability to tell your company's story in the early days is the most important thing you can have," Sequent President Casey Powell said.

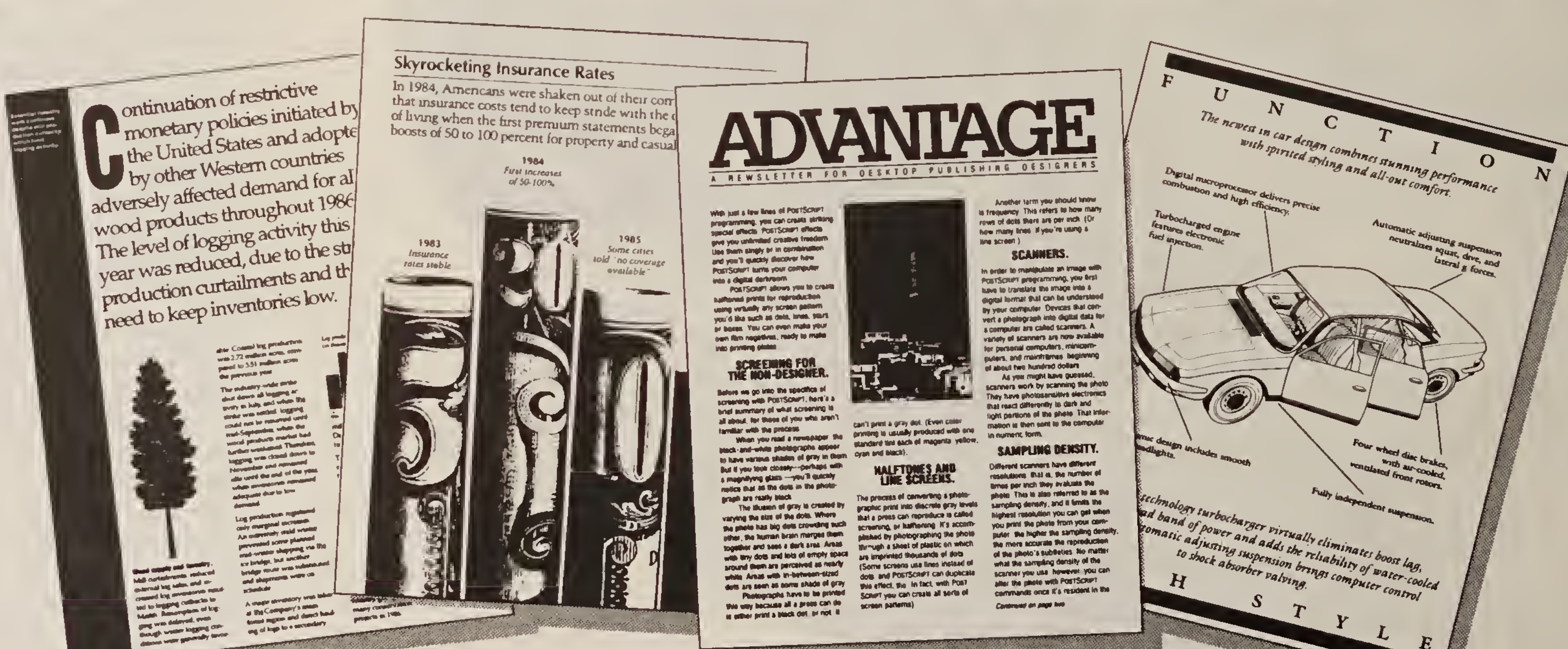
Marc Schulman, director of research at Salomon Brothers, Inc., outlined an aggressive DEC product strategy in the next two years to compete with high-end minisupers and low-end workstations. He said each uniprocessor unveiled by DEC will feature multiprocessor versions. The four-CPU version of the Argonaut, scheduled for a March 1989 release, will offer 45 million to 50 million instructions per second (MIPS), and the four-CPU version of the Aquarius, scheduled for December 1989, will reach 80 to 85 MIPS, Schulman said.

Similarly, IBM will target the market with an enhanced vector facility on its next-generation Summit mainframe in 1990, said John B. Jones Jr., senior analyst at Montgomery Securities. Jones also noted IBM's recent series of university computing grants, its strategic agreement with Los Alamos National Laboratory and its investment in former Cray Research, Inc. designer Steve Chen's supercomputer start-up.

"IBM has begun to use its marketing muscle to get shares in this area," Jones said.

Convex President Robert Paluck, however, said that new DEC products will be easier to

Freedom of Press.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sell against than current customer expectations of those products.

"We've only touched 10% of our potential buyers," he said. "DEC salesmen will unleash the rest of that base, and if your product is five to 10 times better, you can get that business."

Saving application

Many vendors complained that a dearth of third-party applications software to run on their CPUs is hindering their growth. Several venture capitalists at the conference, acknowledging their strong financial backing for hardware companies, said software must focus on vertical, and thus smaller, potential markets.

"The PC had Visicalc and 1-2-3, and the workstations had electronic computer-aided design software. But our market hasn't seen that breakout application yet," Alliant President Ron Gruner said.

But graphics has been the key force behind software so far, said Richard Edwards, an analyst at Robertson, Colman & Stephens. He noted an increasing number of alliances between systems vendors and graphics developers, including Alliant's acquisition of Raster Technologies, Inc. and DEC's codevelopment with Evans & Sutherland.

NICKELS & DIMES

Encore Computer Corp.'s financial woes appear to have eased; the firm recently reported its third consecutive profitable quarter. Revenue for the parallel processing system maker was $9 million, a 156% increase over the same period in 1987, and net income came in at $649,000, or 3 cents per share, compared with a net loss one year ago of $1.7 million, or 8 cents per share.

The shortage of dynamic random-access memory chips and their resultant price increases hit **Televideo Systems, Inc.** in the pocketbook last quarter, as the company coupled a slim increase in revenue with a hefty loss in net income. The microcomputer and terminal maker announced quarterly revenue of $25.6 million, a 7% rise over results recorded a year earlier, and posted a net loss of $6 million, or 13 cents a share.

Borland International announced revenue for the year ended March 31 of $81.6 million, compared with $38.1 million in the previous year. Profits were $1.8 million, or 3 cents per share, compared with $1.3 million, or 2 cents per share, in the same period a year ago.

Novell, Inc. announced revenue for the second quarter ended April 30 of $68.4 million, compared with $42.3 million one year earlier. Profits were $8.5 million, or 31 cents per share, compared with $4.5 million, or 18 cents per share, in the corresponding period a year ago.

Intelogic Trace, Inc. reported revenue for the third quarter ended April 30 of $34.9 million, compared with $33.4 million last year. Profits were $4.5 million, or 30 cents per share, compared with $2.5 million, or 17 cents per share, in the like quarter a year ago.

Fujitsu America, Inc. announced that its revenue for fiscal 1987, which ended March 31, exceeded $1 billion dollars for the first time in its 12-year history. The company's total revenue, which includes its seven subsidiaries and one joint venture company, was approximately $1.21 billion, compared with total revenue of $822 million for the previous fiscal year — a 47% increase.

Leong

FROM PAGE 119

the onion, users get a certain number of features, and they have to keep buying additional layers before getting the entire onion. Before long, they have spent thousands of dollars for a product they expected would fulfill expectations with the first release — and probably shed a few tears in the process.

Ask any user of networking, hardware and software, and you will hear horror stories about products that were delivered and didn't offer the things on the fine-print label.

Hypeware takes on many shapes and forms.

A word processing package promises to support many users and thousands of printer configurations. Unfortunately, the ad doesn't tell you that you need 1M byte of random-access memory on your personal computer to make this work.

This happened to one user at a major aerospace company: "I really liked the package, but it turned out that I was the only one in my department with 1M byte of RAM. I like to have my word processing files read by others in the group. It didn't make sense for everyone else to upgrade. It turned out to be a write-off for the company."

A T1 multiplexer is touted as offering dynamic routing and automatic backup. Yet to realize the full potential of these features, users have to have a full-time network manager on board just to implement these capabilities. Said one user at Hughes Aircraft, "It was humanly impossible to implement the features it was talking about in the brochure. We wound up not using some of the bells and whistles."

Unfortunately, there isn't a solution to Hypeware any time soon. It is still in the user's court to take the initiative. You will still have to investigate the supplier's financial viability and the product's ability to work.

Users who haven't done so yet should have their company invest the money in a technology testing lab. Several companies, such as Pacific Bell and Atlantic Richfield, have made great strides in doing so.

Hypeware is everywhere. But there is no reason to succumb. Ask the penetrating questions. Talk to other users. Set up a pilot. Then, and only then, pick up the phone.

Leong is *Computerworld*'s West Coast Bureau Chief.

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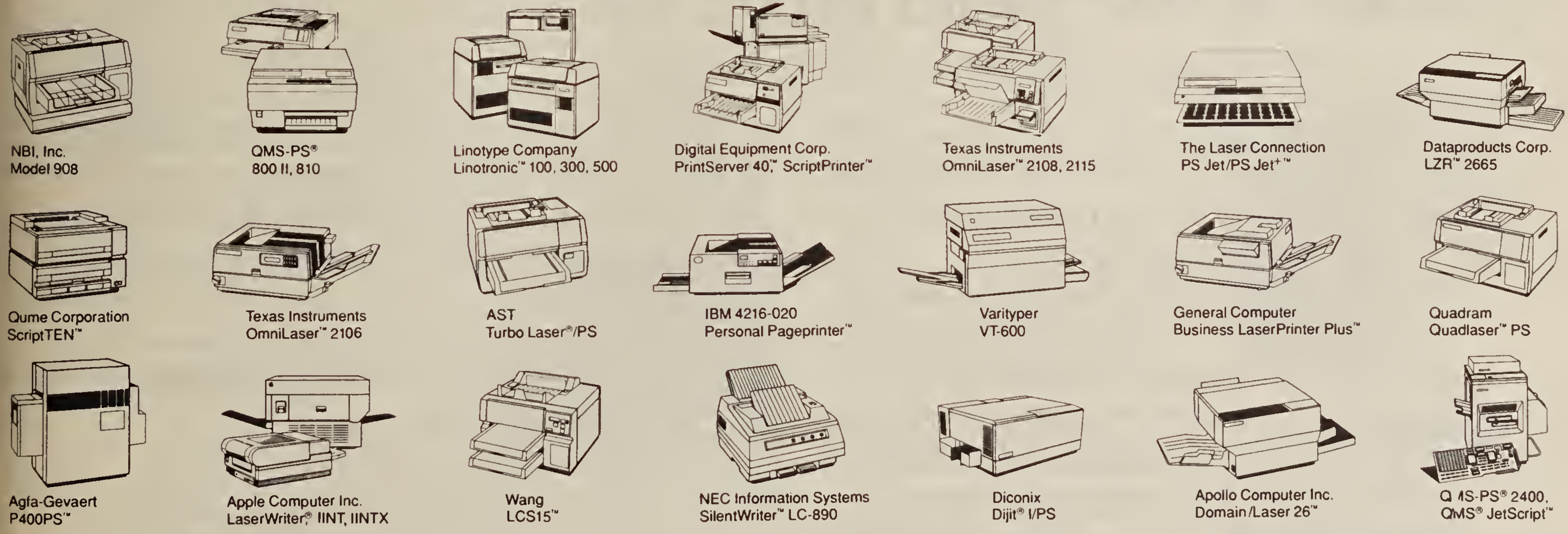

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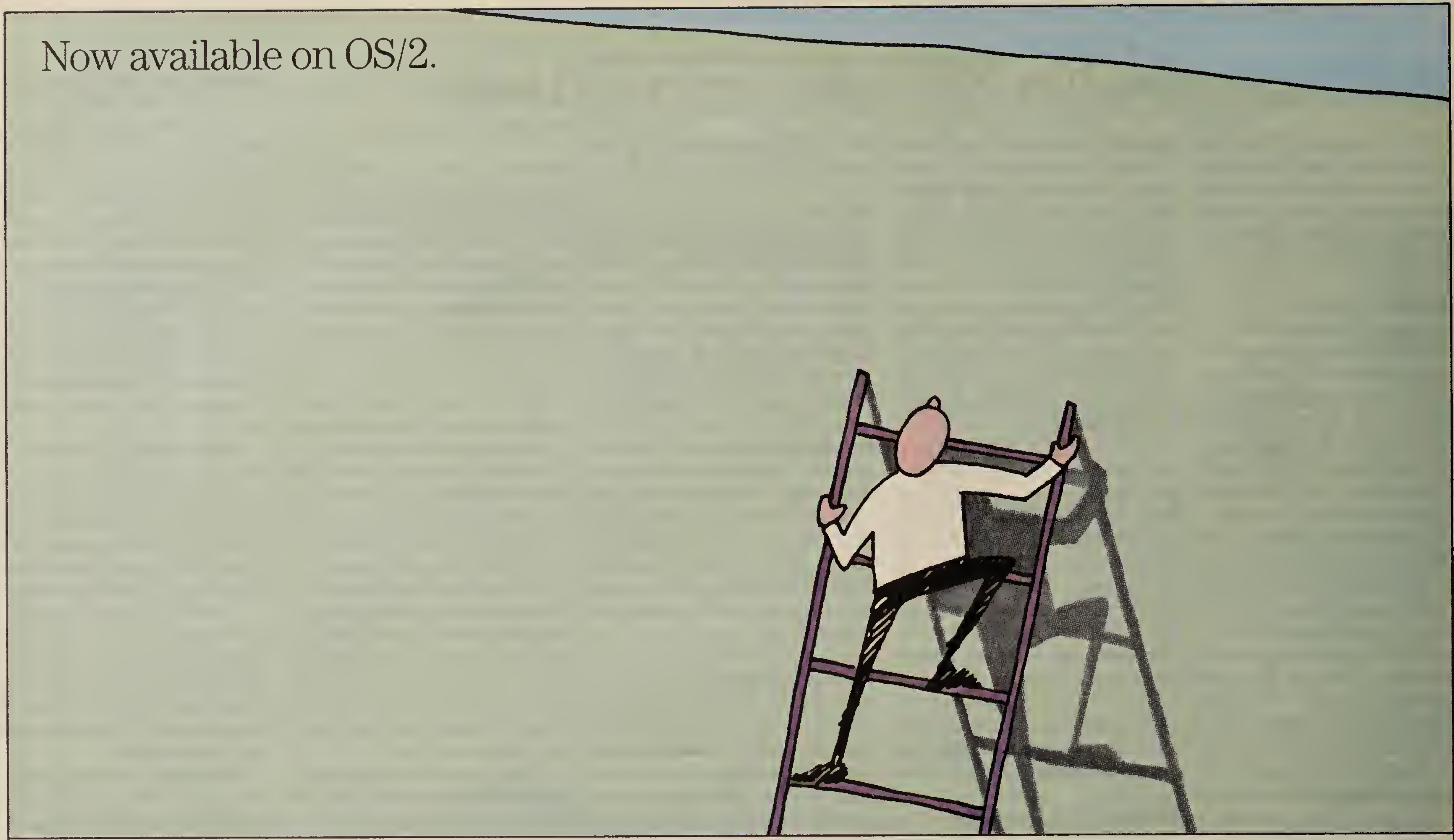
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Chairman

CONTINUED FROM PAGE 119

with the binary portability that is behind the Application Binary Interface [ABI], Sparc seems favored.
Sparc is only one of the ABI's architectures. The open architecture that we support includes Open Look, X-11 and News, NFS and RFS with Unix V. They run on several instruction sets, including Sparc, the Intel 80386, the Motorola 68000 and others.

Compare that with DEC, for example, which offers a single instruction set, the VAX. But above we find VMS, Ultrix and soon, if I have understood correctly, an AIX derivative. Like it or not, that makes three architectures. Where's the simplicity and where's the confusion?

I really believe there is an opportunity for us to attack Hewlett-Packard or DEC sites that might be troubled by a situation in which they're being offered several architectures. One is proprietary, the second is something like Ultrix or HP-UX — which are made obsolete by the OSF announcement — and the third is pure vaporware.

> "IT WILL be several years before OSF applications will be available, unless OSF turns out to be System V."
>
> SCOTT MCNEALY
> SUN MICROSYSTEMS, INC.

Has the idea of a unique Unix disappeared?
Taking into account the competition and the evolution of technology, the presence of a single Unix system everywhere and for everyone was highly improbable. So let's just say that we are at the center of a major standard.

The difference is that System V exists, that NFS, Sparc, X-11 and News are being shipped, and Open Look — already well defined — will be shipped this year. And all of this is open — not open in the sense of a committee, but in a multivendor sense. And that is what counts. All true standards were introduced in this way before being ratified and controlled by committees.

But doesn't that mean the kind of closed approach for which AT&T and Sun have been criticized?
[That is] an unjustified reproach. Openness was clear, and marketing conditions were perfectly defined, known by all and identical for everyone.

Can as much be said about OSF? To which machines will OSF products first be ported? They cannot be ported to all machines simultaneously. In fact, it's obvious that the first to be ported will be those from IBM. AIX currently runs on all IBM product lines. All applications and technology run under AIX.

What will DEC and Hewlett-Packard do? And the others? And [Honeywell] Bull? How could they decide that it was more secure to chase IBM rather than chase us? It's ridiculous, because System V will remain a standard. It was adopted first, it can offer more applications and currently has support from major companies like AT&T, Xerox, Unisys and ICL.

Will OSF members say to their clients, "Now we will follow IBM" and explain to them that they will have products two years after IBM?

That isn't exactly what they're saying.
But it's what their clients have understood. If IBM frightens them enough, simply by its strength on the marketplace, into adopting AIX, then it will be in a position to define OSF orientation — making the other vendors adopt its user interface, for example, and a good portion of Systems Network Architecture. And on top of that, IBM will get royalties.

You seem disappointed by the attitude of Hewlett-Packard and the Europeans. How do you explain it?
I can't explain it. Maybe there was a very strong belief that a committee could create open specifications rapidly and effectively. But this seems a bit naive. This has only happened very rarely and, in any case, very slowly.

Is the situation blocked? ICL and Unisys seem to have left their doors open with a wait-and-see attitude.
It seems that way to us, too. If OSF beats us on the Unix market with better products and more applications than run on System V, we will rally to it. We believe that we are capable of developing the best products, even under OSF. We immodestly believe we understand Unix and the Windows environment better than most of our competitors.

In reality, the situation will probably be the opposite. No one can say when the first application will run under OSF, because OSF doesn't exist.

It will be several years before OSF applications will be available, unless OSF turns out to be System V. Don't forget that AIX is an implementation of System V. It will be difficult for OSF to distance itself from our implementation of System V.

Even if I'm wrong, OSF will require five years before it gets to the level currently offered by System V.

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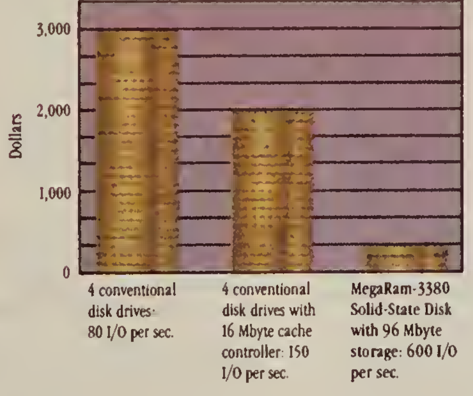

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IBM offers growth, to a point

Although hiring is off, the firm's people-oriented culture remains intact

BY KATY GURLEY
SPECIAL TO CW

Ex-IBM employees agree: IBM is a great place to get career experience and to work with job security for 30 years. It is not a great place for restless entrepreneurial people who want to be company presidents. And it is probably not the best place to look for a mid-life career change.

IBM offers training, experience, mid-management promotions and job security, former IBM executives say. It has good benefits, bright people and smart management.

However, with members of its huge work force competing with one another, the company does not offer a lot of opportunity to reach positions at its policy-making level.

Six of one . . .

In short, IBM offers more than enough for some — and not nearly enough for others.

The kind of people who do best at IBM in the long run are those that consultant Brian Jeffrey, managing director of International Technology Group in Los Altos, Calif., calls "aggressive conformists" — people who want to get ahead but remain team players.

Other former employees reflect similar views. "When you reach 40, you're at a critical path there, because if you're a first-line manager, that's probably where you're going to stay," says Bob McGrath, a consultant to Northern Telecom, Inc. in Dallas and an IBM sales and marketing executive from 1953 until 1969.

McGrath, the founder of Ex-IBM Corp. in Dallas, which publishes a directory of former IBM executives, says the reason he left the company was that he believed he could not do anything to affect it.

'On-the-job retirement'

Similarly, Geri Riegger, who worked in training, marketing support and product development at IBM from 1961 to 1969 and 1973 to 1977, says that at a certain point, "you sort of retire on the job, which I did not want to do.

"I think they try to pick people to move along an accelerated career path, and if you perceive they are not doing that for you, you move on," says Riegger, who is currently vice-president of computing and networking operations at Empire Blue Cross/Blue Shield in New York.

But Riegger says her experience at IBM was wonderful. "IBM is very good at developing personnel," she emphasizes. "They took a young and inexperienced person and gave me a lot of training."

> "IBM IS VERY good at developing personnel. They took a young and inexperienced person and gave me a lot of training."
>
> GERI RIEGGER
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McGrath says the situation he left can be attractive for others. "If you want to do the same thing for 20 years, that's fine. I'm not knocking it," McGrath says. "If you like a large company, then you're at the best."

One former IBM employee who is now a senior executive says he felt little in the way of constraints while with the company.

You can go your own way

"A lot of people say IBM accuses its people of being too entrepreneurial. But I don't remember getting nailed for that," says Robert Erwin, who managed data processing operations at several locations while with IBM between 1950 and 1979.

"A lot of people just didn't test the boundaries. I never felt restricted in my job," says Erwin, who left IBM for a videodisk venture partly owned by IBM and is now president of software developer Datalex, Inc. in San Francisco.

In general, IBM is not currently in a hiring mode, company spokesmen say. Aware of middle-management fat, IBM trimmed about 13,000 employees from its roster in 1986 and 1987 through a retirement incentive program. At the end of last year, it employed about 228,000 people in the U.S., of whom 32,632 were in management, a spokesman says.

Jobs still plentiful

But even in a period of slack recruitment, IBM has hired about 5,400 professionals annually in recent years, according to the spokesman.

Of these, about 3,700, or two-thirds, are recent college graduates, and the rest what the company calls "experienced professionals."

The majority of professionals hired in recent years have been placed in engineering, programming, customer relations, sales and marketing.

Very few people are now hired in other areas, including information systems.

IBM emphasizes recruitment of women and hires them in equal numbers with men, a spokesman says. Currently, 30% of the company's employees are women. Last year, 6,202 of them were managers and 600 ranked as executives. Two women are vice-presidents.

Employee orientation

Several former IBM employees emphasize the company's regard for its employees. One illustration of that regard is the practice of granting employees personal leaves of up to a year.

The leaves are granted for needs such as care of children or elderly relatives but might also be approved for activities such as writing a book.

IBM spokesmen say that the company's corporate culture is fostered by three central principles: respect for the individual, the pursuit of excellence and service as a way of life.

Despite belt-tightening, corporate reorganizations and some disappointing new products in recent years, this culture has remained in place.

And that is why IBM veterans say that despite the drawbacks, the company is still one of the best to work for.

Gurley is a free-lance writer based in Wellesley, Mass.

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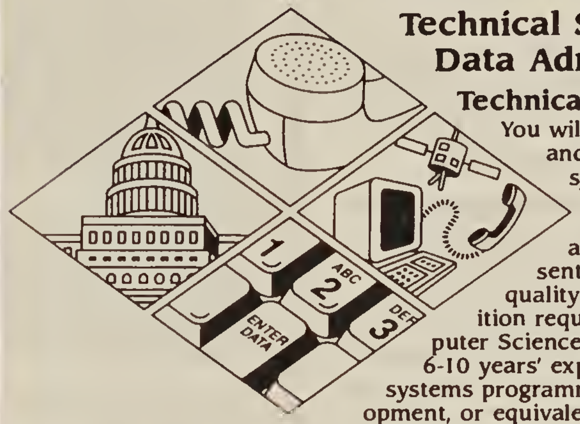

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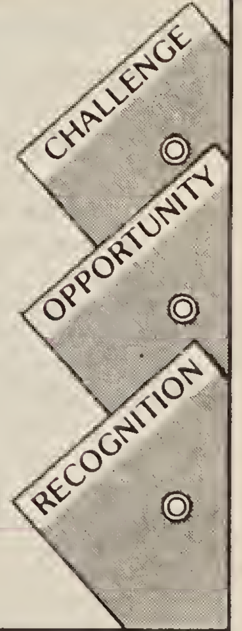

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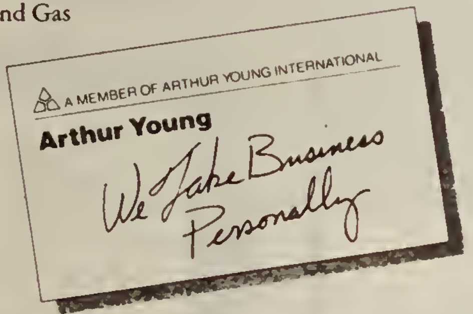
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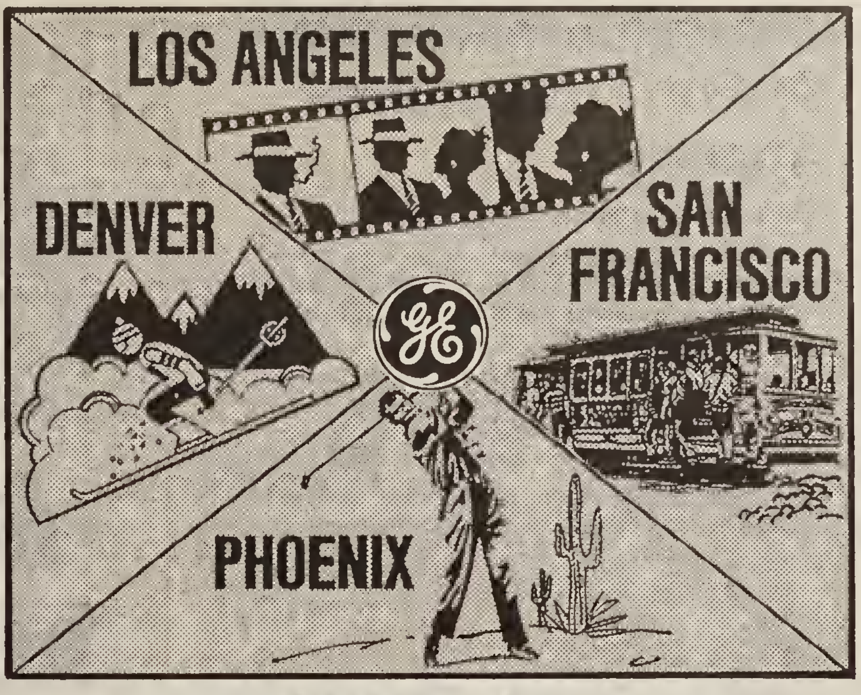

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MARKETPLACE

Graduates help market supply

Students unload Mac Pluses, driving prices up and down in Mac market

BY CAMERON HALL
BOSTON COMPUTER EXCHANGE CORP.

There is usually a wave of computer trading in late spring, and this year is no exception. This season, the student sell-off special has been the Apple Computer, Inc. Macintosh Plus. The result for the Mac market is lower Macintosh 512 prices, steady Mac Plus trades, rising Mac SE values and scarce Mac IIs.

The Mac SE with two floppy drives was up $25 to $1,950, and the hard-drive model experienced an increase in demand and a new high of $2,425.

The Mac Plus was quite active in constant trading and was steady all week at $1,075. The 20M-byte Mac Plus was also selling at last week's close. The Mac 512 sold down $75, at $850. The Mac IIE had a new midweek high of $775 but closed off $25 at $750.

Demand for the IBM Personal Computer and PC AT was met with steady supply, with prices moving up $50 for the PC AT Model 099 and Model 239. Volume block trades were slow as the market apparently awaited IBM's impending announcement of new Personal/System 2 computers.

This announcement fueled inquiries about how to outplace large blocks of PCs and PC ATs from firms planning to buy PS/2s. It is a good time to look for deals in block lots of IBM PC AT-era hardware.

Prices for Compaq Computer Corp.'s Portable 286 and Deskpro 286 and 386 machines were steady in active trading after dropping in recent weeks.

The Compaq line traded at the previous week's prices, with only the Portable III down, losing $75 to close at $2,700. A steady supply of the original Compaq Portable was available at $800.

The Boston Computer Exchange can be reached at 800-BOCOEXX or 617-542-4414 in Massachusetts.

The BoCoEx Index

Closing prices report for the week ending June 3, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$800	$850	$550
AT Model 099	$2,350	$2,425	$1,750
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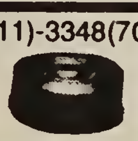

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ADDRESSES: For those who intend to submit a proposal on this project, copies of the request for proposals can be obtained without charge from: Department of Administration, Division of Finance, P.O. Box C, Juneau, AK 99811-0204, or telephone (907) 465-2240. Additional data is available for inspection at: Department of Administration, Division of Finance, State Office Building, Juneau.

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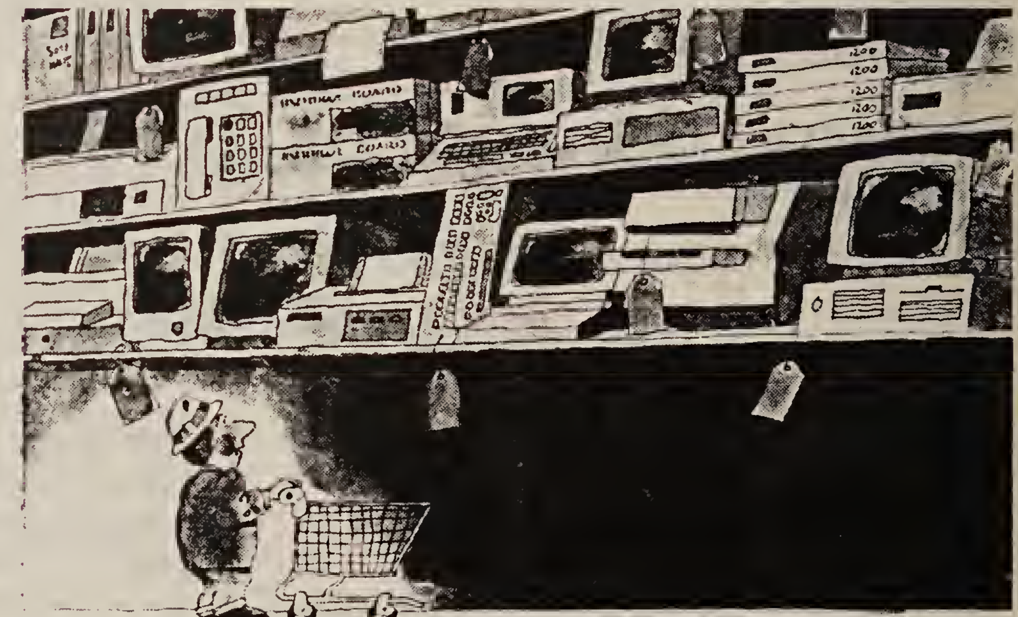

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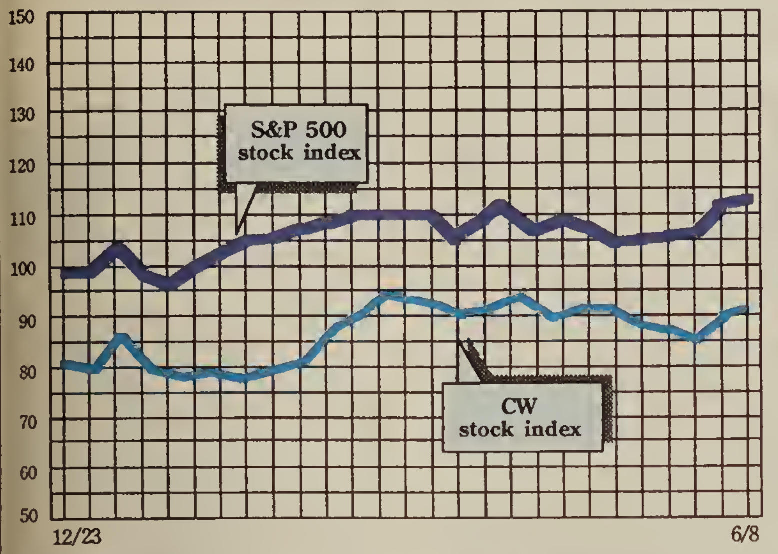

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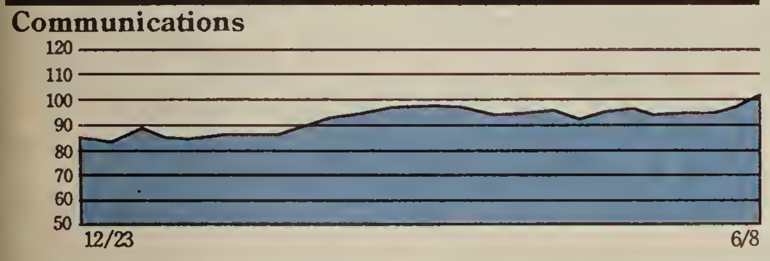
Computer Systems	100.3	**104.6**
Software & DP Services	98.0	**101.0**
Semiconductors	69.1	**73.1**
Peripherals & Subsystems	82.4	**84.2**
Leasing Companies	126.2	**125.0**
Composite Index	90.8	**91.7**
S&P 500 Index	111.5	**113.5**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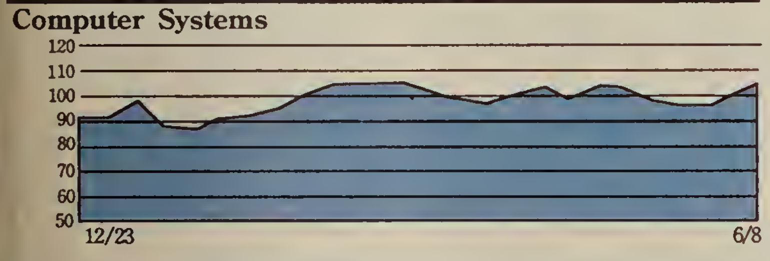
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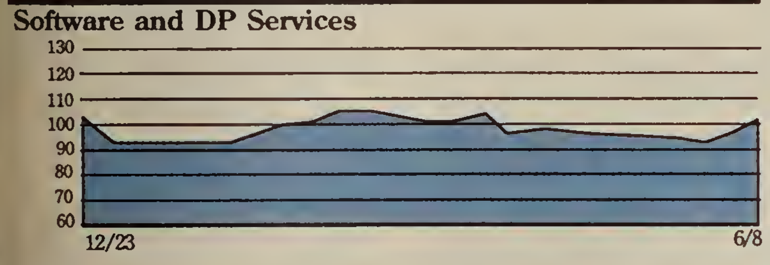
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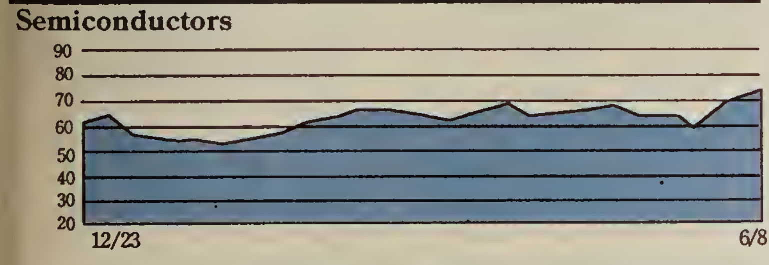
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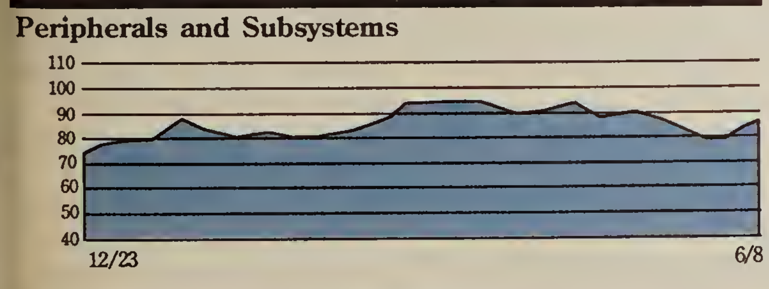
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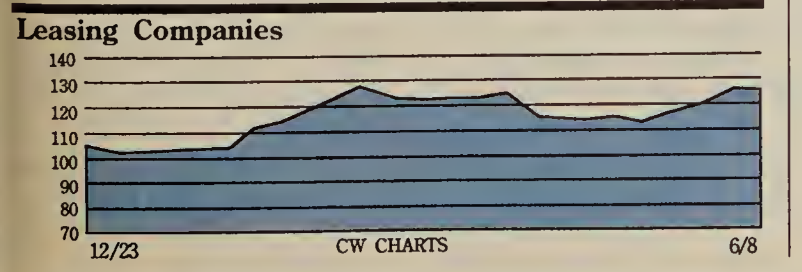
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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 8, 1988

Communications and Network Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JUNE 8 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	100	74	93.63	1.8	1.9
Q	ANDREW CORP	18	11	15.25	0.3	1.7
Q	ARTEL COMM CORP	3	1	2.13	0.0	0.0
N	AT&T	36	20	27.25	-0.5	-1.8
Q	AVANT GARDE COMP INC	6	2	2.00	0.0	0.0
Q	AVANTEK INC	17	6	7.25	0.4	5.5
N	AYDIN CORP	35	16	19.75	0.3	1.3
N	BELL ATLANTIC CORP	80	61	73.38	0.5	0.7
N	BELLSOUTH CORP	44	29	42.75	0.9	2.1
Q	COMPRESSION LABS INC	6	2	3.75	0.0	0.0
O	COMPUTER NETWORK TECH	5	1	1.28	0.0	-2.4
O	CONTEL CORP	40	25	33.25	1.0	3.1
Q	OATA SWITCH CORP	10	4	7.88	0.3	4.1
Q	OIGITAL COMM ASSOC	48	20	34.63	2.0	6.1
Q	OYNATECH CORP	33	14	20.75	0.5	2.5
Q	FIBRONICS INTERNATIONAL INC	7	2	3.88	0.4	10.7
Q	GANOALF TECHNOLOGIES	10	5	7.50	0.3	3.4
Q	GENERAL OATACOMM INOS	12	3	3.25	-0.4	-10.3
N	GTE CORP	45	29	37.75	0.0	0.0
Q	INFOTRON SYS CORP	14	5	12.88	0.4	3.0
N	ITT CORP	66	42	50.50	2.1	4.4
N	M A COM INC	16	7	10.13	-0.5	-4.7
Q	MCI COMMUNICATIONS CORP	15	6	14.63	0.6	4.5
Q	MICOM SYS INC	17	7	15.88	0.4	2.4
Q	NETWORK EQUIPMENT TECH INC	28	12	19.13	1.1	6.3
Q	NETWORK SYS CORP	13	7	10.63	0.9	9.0
N	NORTHERN TELECOM LTD	24	14	18.00	0.4	2.1
Q	NOVELL INC	30	12	27.75	4.0	16.8
N	NYNEX CORP	78	58	66.50	0.4	0.6
N	PACIFIC TELESIS GROUP	34	23	30.38	-0.1	-0.4
N	PARADYNE CORP	9	4	5.38	1.1	26.5
A	PENRIL CORP	5	1	5.00	0.6	14.3
N	PLESSEY PLC	38	23	29.00	0.3	0.9
N	SCIENTIFIC ATLANTA INC	20	8	14.25	0.4	2.7
N	SOUTHWESTERN BELL CORP	46	22	38.63	0.5	1.3
Q	3 COM CORP	26	12	21.50	2.6	13.9
Q	UNGERMANN BASS INC	15	5	12.25	0.0	0.0
N	U S WEST INC	60	43	55.00	-0.1	-0.2

Computer Systems

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JUNE 8 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	33	5	6.25	0.5	8.7
Q	ALPHA MICROSYSTEMS	6	3	6.00	0.0	0.0
Q	ALTOS COMPUTER SYS	15	9	9.75	1.1	13.0
A	AMDAHL CORP	51	19	50.63	2.6	5.5
Q	APOLLO COMPUTER INC	24	9	16.00	0.4	2.4
Q	APPLE COMPUTER INC	60	28	45.00	2.5	5.9
N	BOLT BERANEK & NEWMAN	25	12	16.75	0.5	3.1
Q	BRITTON LEE INC	4	1	2.38	0.4	18.8
N	COMPAQ COMPUTER CORP	79	34	55.88	3.9	7.5
Q	COMPUTER AUTOMATION INC	16	6	8.00	-0.8	-8.6
A	COMPUTER CONSOLES INC	10	2	8.50	1.1	15.3
Q	CONCURRENT COMP CORP	24	11	16.75	-0.3	-1.5
N	CONTROL DATA CORP OEL	38	18	27.25	1.9	7.4
Q	CONVERGENT TECH	9	3	3.38	0.2	5.9
Q	CONVEX COMPUTER CORP	18	6	9.13	1.1	14.1
N	CRAY RESH INC	119	47	84.38	5.3	6.6
Q	OAISY SYS CORP	12	5	11.00	0.8	7.3
N	OATA GEN CORP	37	16	22.13	0.1	0.6
N	DATAPOINT CORP	9	3	5.50	-0.1	-2.2
N	DIGITAL EQUIP CORP	200	99	112.00	6.1	5.8
N	FLOATING POINT SYS INC	12	3	3.13	0.4	13.6
N	GOULD INC	34	8	15.00	0.6	4.3
N	HARRIS CORP	41	22	29.63	1.6	5.8
N	HEWLETT PACKARO CO	74	36	58.63	0.6	1.1
N	HONEYWELL INC	91	49	73.50	3.0	4.3
N	IBM	176	102	116.63	3.5	3.1
Q	INFORMATION INTL INC	15	9	12.81	0.2	1.5
Q	IPL SYS INC	3	1	1.88	0.1	7.1
Q	MASS COMPUTER CORP	14	4	4.25	0.0	0.0
N	MATSUSHITA ELEC INOL LTO	228	103	203.25	-1.8	-0.9
Q	MEGAOATA CORP	6	3	3.13	0.0	0.0
Q	MENTOR GRAPHICS CORP	39	14	33.75	2.5	8.0
N	NBI INC	14	4	4.25	-0.6	-12.8
N	NCR CORP	87	50	63.63	2.3	3.7
N	PRIME COMPUTER INC	31	12	17.25	0.8	4.5
Q	PYRAMID TECHNOLOGY	14	5	13.00	1.0	8.3
Q	STRATUS COMPUTER	40	15	30.75	1.5	5.1
Q	SUN MICROSYSTEM INC	45	14	38.25	4.0	11.7
Q	SYMBOLICS INC	5	1	1.31	-0.1	-8.7
Q	SEQUENT COMPUTER SYS INC	23	9	18.50	0.0	0.0
N	TANOEM COMPUTERS INC	37	16	18.75	0.6	3.4
N	TANDY CORP	57	28	47.38	0.3	0.5
N	ULTIMATE CORP	37	12	13.00	0.0	0.0
N	UNISYS CORP	48	24	36.13	1.6	4.7
A	WANG LABS INC	19	10	11.38	0.8	7.1

Software & DP Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JUNE 8 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	AOVANCED COMP TECH	6	1	1.13	0.0	0.0
N	AGS COMPUTERS INC	30	11	25.75	2.3	9.6
Q	AMERICAN MGMT SYS INC	20	9	16.63	0.6	3.9
Q	AMERICAN SOFTWARE INC	19	6	15.25	1.9	14.0
N	ANACOMP INC	11	4	10.75	0.5	4.9
Q	ANALYSTS INTL CORP	10	4	7.75	-0.1	-1.6
Q	ASHTON TATE	33	13	27.50	0.0	0.0
Q	ASK COMPUTER SYS INC	16	6	13.63	-0.4	-2.7
Q	AUTOOESK INC	34	12	30.75	1.8	6.0
N	AUTO OATA PROCESSING	55	16	41.25	1.3	3.1
Q	BOOLE & BABBAGE INC	12	5	9.25	0.0	0.0
N	COMPUTER ASSOC INTL INC	37	15	29.13	1.9	6.9
Q	COMPUTER HORIZONS CORP	15	7	11.00	1.1	11.4
N	COMPUTER SCIENCES CORP	73	38	42.75	1.3	3.0
N	COMPUTER TASK GROUP INC	16	9	10.75	0.1	1.2
Q	COGNOS INC	17	4	6.38	-0.1	-1.9
Q	COMSHARE INC	28	12	16.75	0.6	3.9
N	CULLINET SOFTWARE INC	14	4	8.63	0.9	11.3
Q	OUQUESNE SYS INC	28	10	20.00	0.3	1.3
A	OATA ARCHITECTS INC	16	7	13.75	0.0	0.0
N	GENERAL MTRS (CLS E)	51	30	40.75	-1.9	-4.4
Q	HOGAN SYS INC	16	4	4.50	0.1	2.9
Q	INFORMIX CORP	31	12	20.50	2.0	10.8
Q	INTELLICORP INC	10	2	2.88	0.1	4.5
Q	KEANE INC	16	6	10.50	-1.0	-8.7
Q	LOTUS OEV CORP	40	19	23.50	0.8	3.3
Q	MANAGEMENT SCI AMER	15	6	8.25	-0.5	-5.7
Q	MICRO PRO INTL CORP	7	3	2.88	0.3	12.2
Q	MICROSOFT CORP	79	37	62.00	2.8	4.6
Q	MORINO ASSOCIATES INC	21	7	17	1.3	7.9
Q	NATIONAL DATA CORP	34	20	24.13	-0.6	-2.5
Q	ON LINE SOFTWARE INTL INC	22	9	8.88	0.0	0.0
Q	ORACLE SYS CORP	19	8	18.38	1.3	7.3
N	PANSOPHIC SYS INC	28	11	14.75	0.3	1.7
Q	POLICY MGMT SYS CORP	30	15	24.75	0.8	3.1
Q	PROGRAMMING & SYS INC	14	7	11.50	-0.3	-2.1
Q	REYNOLOS & REYNOLOS CO	38	14	17.75	0.0	0.0
Q	SEI CORP	19	10	18.50	0.9	5.0
Q	SHARED MEO SYS CORP	30	19	22.38	0.4	1.7
Q	SAGE SOFTWARE INC	19	5	5.88	0.1	2.2
Q	SOFTWARE PUBG CORP	20	5	19.25	2.1	12.4
A	STERLING SOFTWARE INC	12	6	7.00	-0.1	-1.8
Q	SUNGARO OATA SYS INC	20	10	17.25	0.5	3.0
Q	SYSTEMATICS INC	33	19	32.00	0.8	2.4
N	SYS. SOFT INC	24	7	16	2.0	14.0
Q	VM SOFTWARE INC	27	7	12.75	-0.5	-3.8

Semiconductors

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JUNE 8 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOV MICRO DEVICES INC	25	8	16.38	0.8	4.8
N	ANALOG OEVICES INC	24	8	15.88	0.8	5.0
Q	ANALOGIC CORP	13	5	6.38	-0.3	-3.8
Q	INTEL CORP	42	18	34.13	2.9	9.2
Q	LSI LOGIC CORP	15	7	13.13	1.1	9.4
N	MOTOROLA INC	74	35	51.38	3.1	6.5
N	NATL SEMICONOUCTOR	22	10	14.75	0.8	5.4
N	TEXAS INSTRS INC	80	36	48.25	2.4	5.2
A	WESTERN OIGITAL CORP	30	11	16.00	0.6	4.1

Peripherals

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JUNE 8 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLOY COMP.	13	3	3.00	0.0	0.0
N	AM INTL INC	9	3	3.75	-0.3	-6.3
Q	AST RESH INC	21	6	15.63	2.9	22.5
Q	AUTO TROL TECH CORP	7	3	4.63	0.0	0.0
Q	BANCTEC INC	15	5	8.00	0.1	1.6
Q	CIPHER DATA PROOS INC	13	4	8.88	0.0	0.0
A	COGNITRONICS CORP	5	2	2.69	0.1	2.4
N	COMPUGRAPHIC CORP	28	19	26.88	-0.1	-0.5
A	OATAPROOUCTS CORP	24	7	9.50	0.0	0.0
A	DATARAM CORP	8	5	6.63	-0.3	-3.6
N	EASTMAN KOOAK CO	71	39	44.88	1.9	4.4
Q	E M C CORP MASS	29	6	7.50	1.0	15.4
Q	EMULEX CORP	9	4	7.25	-0.1	-1.7
Q	EVANS & SUTHERLANO	35	17	17.75	0.8	4.4
Q	ICOT CORP	8	3	3.00	-0.3	-7.7
Q	INTERLEAF INC	24	11	16.63	0.9	5.6
Q	IOMEGA CORP	4	1	3.81	0.2	5.2
Q	LEE DATA CORP	8	3	3.63	-0.1	-3.3
Q	MASSTOR SYS CORP	6	1	2.56	-0.3	-10.9
Q	MAXTOR CORP	31	6	12.00	0.4	3.2
Q	MICROPOLIS CORP	42	13	24.50	1.0	4.3
Q	MINISCRIBE CORP	17	5	11.75	0.9	8.0
N	MINNESOTA MNG & MFG CO	84	45	64.00	1.4	2.2
A	MSI DATA CORP	19	8	13.50	-0.3	-1.8
Q	PERSONAL COMPUTER PROOUCTS INC	7	4	5.63	0.0	0.0
Q	PRIAM CORP	6	1	2.00	0.1	6.7
Q	PRINTRONIX INC	13	7	10.13	0.5	5.2
N	QMS INC	27	8	10.25	0.9	9.3
Q	QUANTUM CORP	23	8	11.00	0.3	2.3
Q	RAMTEK CORP	6	1	1.31	-0.1	-8.7
N	RECOGNITION EQUIP INC	22	7	6.63	-0.6	-8.6
Q	REXON INC	11	4	4.50	0.4	9.1
Q	SCAN TRON CORP	17	7	14.88	0.0	0.0
Q	SEAGATE TECHNOLOGY	42	10	18.25	0.6	3.5
N	STORAGE TECH CORP	5	1	1.75	0.1	7.7
Q	TANOON CORP	6	1	2.38	0.1	2.7
A	TEC INC	7	3	4.25	0.1	3.0
N	TEKTRONIX INC	41	21	25.63	0.5	2.0
Q	TELEVIOEO SYS INC	3	1	1.31	0.0	0.0
N	TELEX CORP	80	30	48.75	0.9	1.8
Q	WYSE TECH	40	11	20.00	1.6	8.8
N	XEROX CORP	85	50	53.75	1.4	2.6
Q	XIOEX CORP	15	5	5.50	0.0	0.0

Leasing Companies

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JUNE 8 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	CAPITAL ASSOCIATES INTERNATIONAL INC	11	4	5.88	0.0	0.1
N	COMOISCO INC	37	12	22.50	1.4	6.5
N	CONTINENTAL INFO SYS	13	5	6.75	-0.3	-3.6
Q	PHOENIX AMERN INC	5	2	3.00	0	0
Q	SELECTERM INC	6	3	4.88	-0.4	-0.71

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL;
O = OVER-THE-COUNTER; S = SPLIT

O-T-C PRICES ARE BIO PRICES AS OF 3 P.M. OR LAST BIO
(1) TO NEAREST DOLLAR

Green thumb

Sun shines bright on high tech; DEC, Cray take blue ribbons

The Dow Jones industrial average followed its biggest single-week point gain with another winner last week as the sun shone on Wall Street and computer issues were sprouting.

The big controversy concerned the on-again, off-again rumors that Unisys Corp. was considering a takeover bid for NCR Corp. Although the firms remained tight-lipped, both benefited from the whispering: NCR jumped 3¾ points higher than a week earlier to finish Thursday at 64¾, and Unisys gained 2⅜ points to close at 36⅜.

Other big winners for the four days of trading included Cray Research, Inc., which continued its recent upswing, gaining 5⅛ points to 83⅞; Digital Equipment Corp., up 5 points to 110¾; Amdahl Corp., which jumped 4 points to 51½; Sun Microsystems, Inc., up 3 points to 37¾; 3Com Corp., up 2¾ points to 21¼; and Compaq Computer Corp., which gained 2½ points to 56½. Microsoft Corp. gained 2¼ points to 61¾; Computer Associates, Inc. rose 2¼ points to 28⅞; Hewlett-Packard Co. rose 2⅛ points to 58⅜; IBM was up 2⅛ points to 115⅜; and Novell, Inc. gained 2 points to 27¾.

JAMES DALY

1-2-3

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ing to major alternative spreadsheets.

Microsoft launched its assault about 10 months ago with a DOS version of its popular graphics-oriented Apple Computer, Inc. Macintosh Excel program amid gushing reviews and wide user interest.

Borland followed suit in late 1987 with a work-alike program that performance-hungry users could customize to look and feel like 1-2-3.

"Lotus isn't in any trouble in the DOS market," said Bill Higgs, director of software research at Infocorp. "They're going to lose a certain amount of market share, but it's not going to be like what 1-2-3 did to Visicalc."

Lotus is enjoying an even stronger position in corporate America, which represents a bellwether for spreadsheet sales success. Despite a few examples of big 1-2-3 users switching to Excel or Quattro, most Fortune 1,000 users are sticking with the tried-and-true industry standard.

"If you've invested a lot of dollars and bodies in building applications on 1-2-3 and supporting it, you're going to stick with 1-2-3," said Mort Rosenthal, chairman and chief executive of Corporate Software, Inc. in Westwood, Mass.

Rosenthal estimated that 1-2-3 currently accounts for more than 90% of Corporate Software's spreadsheet sales to Fortune 1,000 customers. He expects those numbers to remain constant now that the novelty of the two challengers has begun to wear off.

Uphill battle

Excel and Quattro are both working against history in their efforts to nibble away at 1-2-3. As with any firmly entrenched industry standard, such as Ashton-Tate Corp.'s Dbase, users are reluctant to give up what they are familiar with even if the alternative offers better performance or a lower price.

Yet there have been users who have recently cut their long-standing ties to 1-2-3. Most notably, some of the country's Big Eight accounting firms — including Arthur Young Co., Deloitte, Haskins & Sells and a group within Arthur Andersen & Co. — have adopted Excel.

Arthur Andersen, which dumped 4,000 copies of 1-2-3 in favor of Excel last March because of its ease of use, said it has no regrets.

"The more we use the product, the more we like it. It's really paying off," said Jack Dreiss, director of development in Arthur Andersen's advanced computer audit techniques group, which made the switch.

Other users have flocked to Excel because of its advanced graphical user interface and graphics capabilities. "When I was a 1-2-3 user, I took for granted that you had to have poor graphics and leave your program to do a chart," said Hy Levy; a systems assistant manager at TRW, Inc. in Redondo Beach, Calif., who switched to Excel.

> "LOTUS isn't in any trouble in the DOS market."
>
> BILL HIGGS
> INFOCORP

In addition to the standard barrier, Microsoft has to overcome the fact that widespread implementation of Excel means opening up a thick wallet. System requirements include advanced Intel Corp. 80286- and 80386-based personal computers, added memory and graphics cards.

And although Borland claims that many new Quattro users are 1-2-3 defectors, Quattro is viewed by some as a short-term answer to more serious 1-2-3 deficiencies.

Not done yet

While Lotus's stranglehold on the DOS market shows no signs of waning, the company is expected to face its greatest challenge in the upcoming IBM OS/2 Presentation Manager market. Having all but conceded a serious stake in the DOS market, Microsoft is poised to attack Lotus on advanced 80386-based platforms.

With Lotus staying quiet on a ship date for 1-2-3/G, its entry in the graphics-based Presentation Manager field, Microsoft is already talking victory.

"I don't think anyone in this business thought 1-2-3 was going to stop selling on the old-generation machines it was designed for," said Jeff Raikes, director of applications marketing at Microsoft. "But Excel is positioned for a new generation of graphical user interface and high-performance platforms, and that's where the future is."

But if its steadfast performance and cadre of users in the DOS world are any indication, 1-2-3 will not go down quietly in any environment.

Nynex buys AGS branch

WHITE PLAINS, N.Y. — Nynex Corp. agreed late last week to acquire the professional services and software businesses of AGS Computers, Inc. for approximately $273 million, or $21 per share.

Nynex will acquire all of AGS's outstanding shares, then spin AGS's Microamerica microcomputer distribution business back to AGS shareholders. Nynex will operate AGS as a subsidiary under current Chairman Lawrence Schoenberg, while current Microamerica management is expected to remain the same.

The deal marks the entrance of a large new player into the systems consulting and integration business, which is hotly competitive.

"AGS realized it was no longer competing only with $200 million companies like Computer Task Group," commented Charles Federman, a partner with acquisition specialists Broadview Associates. "Access to capital is more important than ever."

CLINTON WILDER

S. Africa

FROM PAGE 1

cause of the South African government's ability to impose its racist system with the help of computers that document nonwhites for police information. "Computers are key because they are so strategic," explained Donna Katzin, director of South Africa programs at the Interfaith Center on Corporate Responsibility in New York. "They make it possible to track people through their passbooks and their records. And control is the No. 1 feature of apartheid."

Levering

Pressure on vendors, including Unisys Corp. and IBM, has taken two forms: forming shareholders' resolutions at annual corporate meetings and lobbying municipalities to impose restrictive buying legislation targeted at the vendors.

Of the approximately 15 cities and counties across the nation that have purchasing ordinances, only one MIS director, in Boston — Massachusetts is the only state with a policy — said the ban will have a direct effect on computer operations.

"If it forces us to be a lot more shrewd in the way we go about purchasing, we will," said Allan Stern, director of MIS for the City of Boston. In the next three weeks, Stern said, the city will buy an IBM 3090-class computer, and because IBM does business through a subsidiary in South Africa, Boston will evaluate plug-compatible manufacturers' (PCM) wares and may resort to buying a used IBM machine from a company with no direct ties to South Africa.

It would be difficult to stay in an IBM environment and not do business with companies whose products are available in South Africa. Products from PCMs are generally available in South Africa through subsidiaries or distributors. Additionally, both National Advanced Systems and Amdahl Corp. — the two major PCMs — have close relationships with Japanese companies that maintain active South African operations.

"We're in a bit of a fix," said Charles Yancey, a Boston City Councilman. "We are quite serious about promoting economic sanctions against South Africa." If that means scrapping the IBM environment for a new system that is inherently more costly because of the massive changes needed to support it, Yancey is prepared to proceed.

The price, however, is important in other municipalities. In San Francisco, the operative words are "fiduciary duties." "If heretofore we were doing business with a 'dirty' company, if it costs too much money to change, we don't have to," said Henry Nanjo, MIS director for the city. Nanjo said San Francisco has stopped buying IBM Personal Computers and instead purchases Compaq Computer Corp. microcomputers; nevertheless, the city continues to support its IBM 3084 Model Q.

Boston's Stern

Some other municipalities with selective purchasing ordinances include Chicago; Harrisburg, Pa.; Houston; Madison, Wis.; New Orleans; and New York.

Effect questioned

Some dismissed the apartheid effect of computers. In a memorandum obtained through the Freedom of Information Act by the American Friends Service Committee, an unnamed IBM official said, "We feel that the fact that it is being done with computers hasn't any appreciable overall effects on the apartheid situation. This pass system could be done in many other ways besides computers."

In countering the criticisms by the College Teachers Retirement Fund, a major Unisys shareholder, Chief Executive Officer W. Michael Blumenthal said last April, "We [the former Sperry Corp. and Burroughs Corp.] have been there since 1930, and we have built up a small but loyal group of employees who depend on us."

But according to a study by Richard Leonard, a New York consultant on U.S. corporate policy in South Africa, that small group included only 78 blacks as of 1986, or about 10% of the work force. "It's really a distortion to say that they're staying to help their black employees when most of their employees are white," Leonard said.

Unisys said it spent $2 million in South Africa last year for social change, including $680,000 for the education of nonwhite students. According to Leonard, the company is deriving about $140 million from South African sales — some of them to Atlantis Diesel Engine, which makes armored military vehicles.

Not only do computers keep extensive files for the South African police, the computer connection remains sensitive to American anti-apartheid activists because the computers are largely supplied by U.S. companies. "Efforts to stimulate the electronics industry in South Africa have included a government policy of price preferences of up to 25% for local content," said T G Alant, South Africa's Deputy Minister of Economic Affairs and Technology, at South Africa's first national computer technology conference last year.

Unisys and IBM executives both acknowledged that they cannot control the resale of their computers to the South African military apparatus. "It is possible that some company that purchases one of our computers may provide services to the [South African government]," Blumenthal conceded.

Still selling

Unisys continues direct sales in South Africa but cannot sell machines to military organizations. IBM has withdrawn from South Africa but continues to distribute its products through a South African firm called International Services Management.

Despite the limitations and loopholes surrounding the bans, they seem to prod more U.S. corporate withdrawals than shareholder resolutions do, according to Richard Knight, a senior research associate with the American Committee on Africa in New York. "One way to [isolate the South African government] is to get U.S. companies to stop doing business with them."

The ban loopholes are, in some cases, unavoidable, Knight said. He credited such bans with leading to the withdrawal from South Africa of Bell & Howell Co., Westin Hotel Co. and Ashland Oil, Inc. He said Ashland withdrew after intense pressure from the City of Los Angeles.

IBM stays support ax

DB2 1.2 users not ready, get 90-day extension

BY CHARLES BABCOCK
CW STAFF

IBM last week put on hold for 90 days its plan to drop support for Release 1.2 of DB2 after it became clear that a sizable minority of its customers would not be able to update their release before the June 30 deadline.

An estimated 2,000 DB2 licenses have been sold, and both IBM officials and DB2 users group spokesmen said that 12% to 15% are still on Release 1.2, which became available in March 1986.

IBM notified customers of its intent to drop support a year ago with the announcement of Release 1.3. Earlier this year, the firm announced Version 2.0 and made it clear that users would not be able to migrate to the new version, which has referential integrity, without first upgrading to Release 1.3.

Hanging tough

Nevertheless, a minority of customers have stayed with Release 1.2. Russell Donovan, IBM's data base products marketing manager in Santa Teresa, Calif., said Release 1.2 is currently stable and the source of "near zero" bug complaints. A customer who continues to use it beyond June 30, however, will run the risk of finding a new problem and having no one at IBM able to respond.

If 12% to 15% of DB2 users are still running Release 1.2 at the end of the month, "they could go on running it a number of months," Donovan acknowledged.

A minority of DB2 customers were taken aback by the imminent end of 1.2 support.

"We knew support would be dropped. But when our staff members mentioned it to several members of the DB2 users group, they were surprised," noted Edward Knauer, principal of Knauer Consulting, Inc. and organizer of the Knauer DB2 User Group in New York.

"People are frustrated with support being dropped for 1.2," said Martin Hubel, vice-president of DBview, Inc. in Waltham, Mass. Hubel taught a DB2 course for his firm in New York last week and was surprised to find that eight of 11 attendees were still using Release 1.2.

A survey by the Chicago-based Midwest DB2 Users Group in April showed that only 14% were still on 1.2, said Howard Fosdick, president of the group.

Midnight oil

"Everybody has been working feverishly to meet the June 30 deadline," Fosdick noted. Nevertheless, he said he expects that "a small but significant number of sites may have a problem."

Prior to announcing the extension of support, IBM officials nervously asserted that users had been given fair warning of the June 30 deadline. "We don't think there's going to be many customers with a problem at the end of the month," Donovan said on Thursday. "If there's a problem, we will take some action to solve it."

The next day, he announced the extension of support through September.

Donovan said the picture was complicated for some customers by the fact that they must implement a major IBM MVS subsystem upgrade in order to install DB2's current release. Release 1.3 will work only with Release 1.7 of IBM's CICS, and some DB2 users are still on Release 1.6 of the teleprocessing monitor.

The new release of CICS was announced more than a year ago, but some sites have not upgraded yet. In addition, customers may need to upgrade their releases of IMS or Data Facility Product to work with DB2 1.3, and they may be waiting until they can do so, Donovan added.

At the same time, DB2 developments have proceeded at such a rapid pace that some customers appear to have simply lost track. "We will move to Version 2.0 as soon as it becomes available [in October]," said one Release 1.2 user, even though the Version 2.0 announcement made it clear that customers must migrate to 1.3 before attempting to run their applications under 2.0.

Vince Hilly, manager of data base administration at Depository Trust Co. in New York, said the upgrades are relatively easy for a trained DB2 user to execute. "We're just in the process now, and it's not a significant effort," he said. Two staff members working part-time were able to execute the migration in a month.

"There's no need to load or unload data from tables or rebind applications," Donovan said.

Although IBM has said Release 1.7 of CICS is required for Release 1.3 of DB2, DBview President Robert B. Ashton said DB2's CICS Attach facility will work with CICS 1.6 or 1.6.1, contrary to IBM's recommendation.

IBM buys new firm's technology

BY CHARLES BABCOCK
CW STAFF

IBM announced last week it has licensed the technology of Scottsdale, Ariz., start-up Transform Logic Corp. to add function to its own application development system, Cross System Product (CSP).

While the nature of the potential fit remains undisclosed, IBM officials said the intent is to use Transform Logic's development system to make CSP into more of an end user-oriented fourth-generation language.

IBM will use the system, known as Transform, "to dramatically improve the productivity of customers' programmer community . . . and to broaden the programmer community to include business professionals," said Martha R. Rivers, CSP product manager.

Combining the Cobol-generating capabilities of Transform with CSP "will create a new class of product," said Vaughan P. Merlyn, president of CASE Research, Inc. in Bellevue, Wash.

A graft of Transform technology onto CSP would allow rapid development of application prototypes with end-user involvement, he predicted. As it stands today, CSP is not a good prototyping system, he said.

Only a few dozen copies of the $300,000 to $350,000 system have been sold by Transform Logic. It is an application development system that can generate Cobol from specifications set early in the development cycle, according to knowledgeable observers.

"A user fills in the blanks on about 25 screens as to what he wants his system to look like and Transform generates the code. You don't have to learn a new programming language," said Roger Philips, former president of Transform Logic and now president of consulting firm Philips Associates in Scottsdale.

CSP is currently a programmer's development system that requires users to learn its syntax, which one user described as a combination of Cobol and Basic.

Merlyn described Transform as "very highly regarded by its customers" but "not very well marketed." One of the main benefits of its ability to convert specifications into code is that it allows modifications to a system at the design and specification level, he said.

Adding functions

Rivers said IBM does not plan to simply fuse the two products. Rather, it will use the underlying technology in Transform to add to CSP capabilities.

IBM has labeled CSP a strategic product and urged customers to develop applications for DB2 with it. A CSP application can run under IBM's CICS or TSO with its MVS operating system, under CMS with VM or under IBM's PC-DOS or the Personal System/2 operating system. That operating system portability was a major reason why CSP was included in IBM's Systems Application Architecture.

Ronald J. Davis, president of Transform Logic, said an active data dictionary enables Transform to convert data relationships and function logic into applications.

9370

FROM PAGE 1

match the Group 15 category.

Along with the price cuts, IBM instituted graduated pricing charges for three software programs, including its Expert System Environment for VM, which previously had a single license fee regardless of processor size.

'This is a step in the right direction," said Marty Gruhn, vice-president of The Sierra Group in Tempe, Ariz. "It's certainly the eleventh hour for them, but it's not too late."

Other analysts, however, were not so optimistic, claiming that the price cuts will have a minimal effect on a product line that has a questionable future.

John McCarthy, an analyst with Forrester Research, Inc. in Cambridge, Mass., said he believes the price cuts are an attempt to lessen the beating the 9370s are going to take from IBM's other mid-range offering, the soon-to-be-announced System/36 and 38 follow-on known as Silverlake.

"Cutting prices for the 9370 is like rearranging deck chairs on the Titanic as it's going down," said John Logan, vice-president of the Aberdeen Group, Inc., a Boston-based research firm.

According to IBM, the price cuts were instituted because "we sought to have a better hardware and software pricing balance, and we are responding to customer requirements."

Prior to IBM's announcement, The Sierra Group had completed a report on the cost of ownership of a mid-range system in which the 9370 was ranked as the most expensive of seven vendors' systems in most configurations, Gruhn said.

Last week, The Sierra Group incorporated IBM's price cuts; it will release a new report this week.

The software programs affected by the cuts are primarily system software, including operating systems, utilities, communications facilities and data base management systems, for the VM and VSE environments. Applications packages were barely represented on the list of cuts, although IBM's Professional Office System (Profs), Cadam and a few others were included.

The price cuts are wide ranging. For instance, a new Group 10 license for VM/IS, the operating system tailored for the 9370, is $22,895, nearly $6,000 less than the old price. A $2,175 savings is available with a Group 10 license for IBM's relational DBMS for VM, SQL/DS. IBM's security system for VM, RACF/VM, has been reduced by $2,085 and can now be licensed for $6,255.

Upgrades to new releases have also been cut. For example, the license fee to upgrade from Profs Release 1 to Release 2 is now $625.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, except: (6) issues in February, May, August and October, (5) issues in January, March, April, June, July, September and November and (4) issues in December with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

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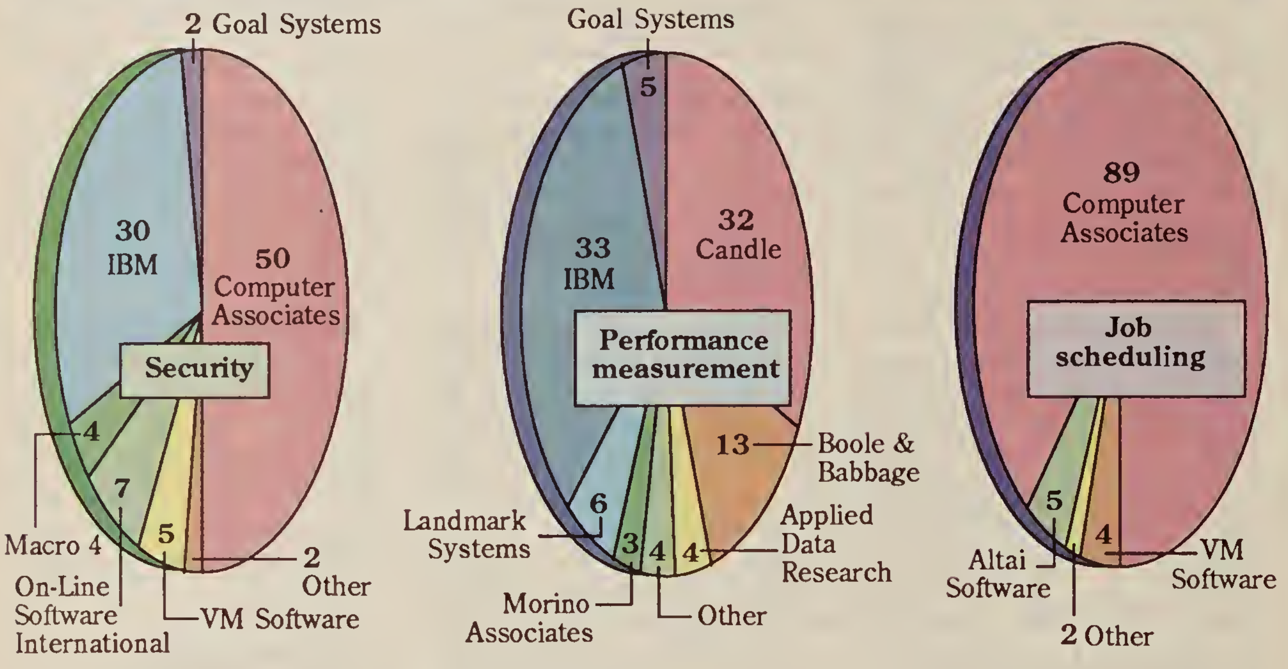
TRENDS

Software utilities

Variety of vendors divvy up growing markets for major utilities



The primary system utilities, such as security, performance measurement or job scheduling, have not shown the dynamic growth of spreadsheets or relational data base management systems, but they continue to chip away at the sites at which they have yet to be installed.

Five years ago, for example, 93% of IBM or plug-compatible mainframe sites polled by La Jolla, Calif.-based Computer Intelligence said they operated without job-scheduling software, even though that utility can make a regular contribution to efficient mainframe use.

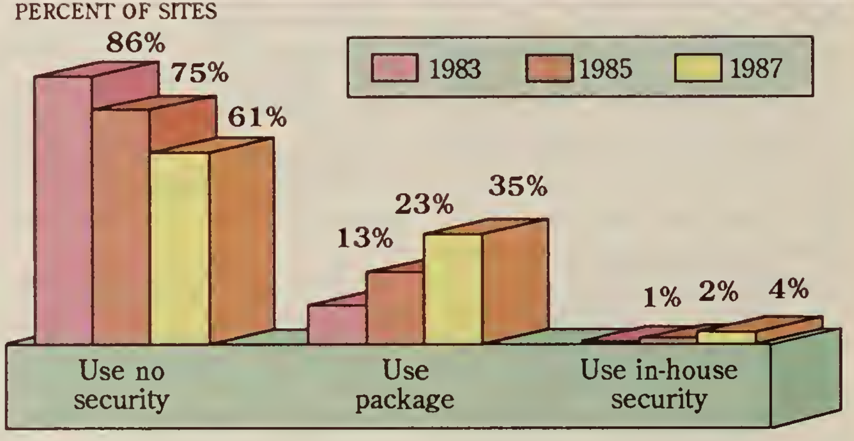
Among other things, a job-scheduling package determines that computer tasks run in their proper sequence, ensuring that an application that needs results from another application will run only after those results become available. By 1985, the percentage of sites not using job scheduling had contracted to 85%, and by the end of 1987, the figure was down to 74%.

In the same vein, the number of sites going without performance monitors or security software has decreased during the last five years. The source of the utilities going into the sites is frequently a third-party supplier's package, with in-house development accounting for a small percentage of the performance monitors.

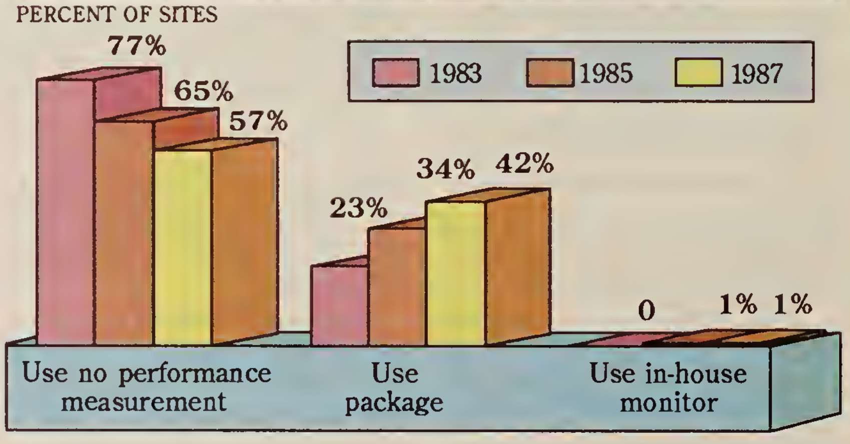
The market for commercial packages has allowed several small firms to grow and prosper. At the same time, Computer Associates International, Inc., the industry's largest independent supplier, has benefited from the appetite for system utilities.

CHARLES BABCOCK

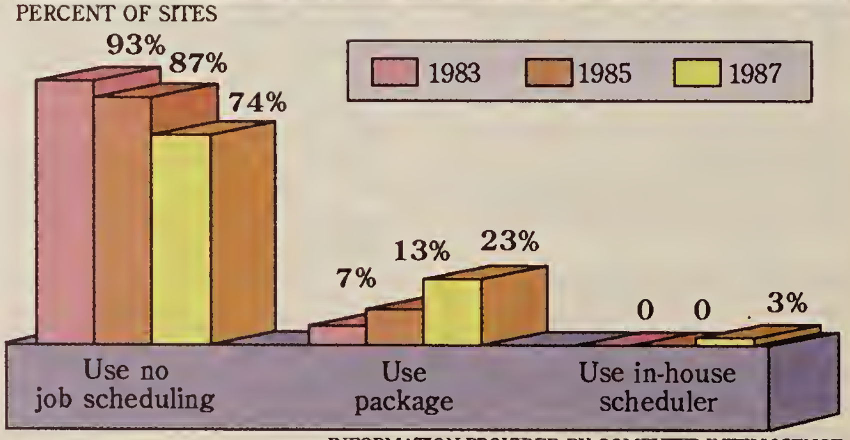
Commercial security package use rising



Performance measurement gaining, too



Job scheduling echos optimistic outlook



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHARTS

INSIDE LINES

The lines (and lawyers) are buzzing. The Chicago-area telephone disaster is finally over; a month after a May 8 fire ripped through an unattended switching station and ruined one of Illinois Bell's five Chicago-area gateways, full service returned early June 5. Now all that remains to be cleaned up is a pile of lawsuits from Chicago companies that claim they lost millions of dollars of business during the outage. "Various companies have filed suit," said Illinois Bell spokesman Tim Bannon, "but we have no comment about it." While the Ameritech subsidiary prepares itself for court appearances, it is conducting an investigation of the outage. The investigation report, due in three to six months, is expected to recommend new security and fire-safety procedures.

Iran was a breeze compared with Congress. H. Ross Perot is a man of action, but his new company's contract to review and revamp the Postal Service's computer operations came a little too quickly for one congressman's liking. Indiana Democrat Francis X. McCloskey, chairman of the House Postal Service subcommittee, has asked the General Accounting Office to investigate the reason that the Perot Systems contract was not opened to competitive bidding. The Postal Service will initially pay $500,000 for Perot Systems to evaluate its operations, but the contract potentially covers 10 years for the vendor to implement its recommendations.

Now that's an early warning system. A published report last week about Lotus readying 1-2-3 Release 2.5 caught the rest of us napping — and apparently Lotus execs were sawing a few logs themselves. According to a key Lotus source, the idea of an upgrade to be positioned between the current 1-2-3 Release 2.01 and the upcoming Release 3 has been kicked around, but it's still in the dream stage and there has been no development effort. Were it that easy to move from concept to reality, there'd already be a lot more Lotus products on the market.

Lots of people counting on that Intel chip. NEC Information Systems apparently loves the P9 and is planning a mid-summer introduction of two systems based on the still-unannounced Intel chip. One system will be a desktop unit; another will be a portable. The P9 is a 32-bit 80386 processor that uses a 16-bit data path, making it a cheap and easy swap for the 80286.

Open systems disintegration. Boeing Computer Services is said to be quite upset over the decision by compatriot General Motors to pull back as a leading spokesman for MAP. Boeing fullfills the same role for TOP. "It's kind of like my talking you into running the Boston Marathon, and then two days before the race, I drop out, leaving you to run the race on your own," one source said. GM's vanishing act puts a tremendous burden on Boeing, which still has basic issues under TOP to resolve, the source claimed. GM's leadership of the MAP specification, while at first welcomed, later became suspect as other users feared supporting a competitor's technology needs during this era of strategic information systems.

The Young and the restless. The battle between Big Eight audit firm Arthur Young and some of its fired former consultants cranked up a notch last week as the new firm formed by the expatriates offered to buy Arthur Young's systems integration consulting business for $50 million. Arthur Young isn't interested in selling, but it *is* interested in suing. It will continue two lawsuits against five principals of the new firm, Chicago-based Technology Solutions Co., for allegedly breaching their employment contracts by trying to solicit new business and employees while still with Arthur Young.

Lots of fingers are pointing to NCR as the source of rumors about the Unisys romance. Two Unisys headquarters — in Detroit and Blue Bell, Pa. — was a surprise, but three would really be stretching it. So, is somebody hoping to drive down Dayton real estate prices and buy cheap, or what? Depressed homeowners can call the CW hot line at 800-343-6474 or 617-879-0700 and tip off News Editor Pete Bartolik.

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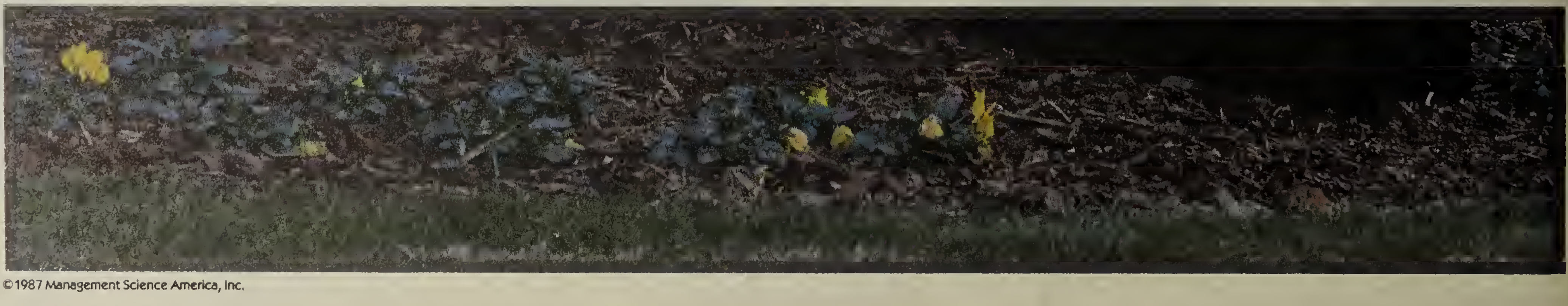

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